VOLUME XXIX NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

MARCH, 1916

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Panorama of Lhasa

9½ x 32 Inches

16 Pages of Photogravure

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The World's Strangest Capital

With 19 Illustrations — JOHN CLAUDE WHITE

Voice Voyages by The National Geographic Society: A Tribute to the Geographical Achievements of the Telephone

With 16 Illustrations

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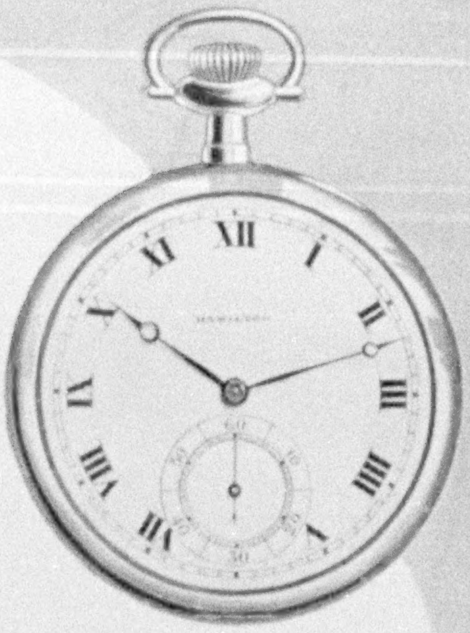

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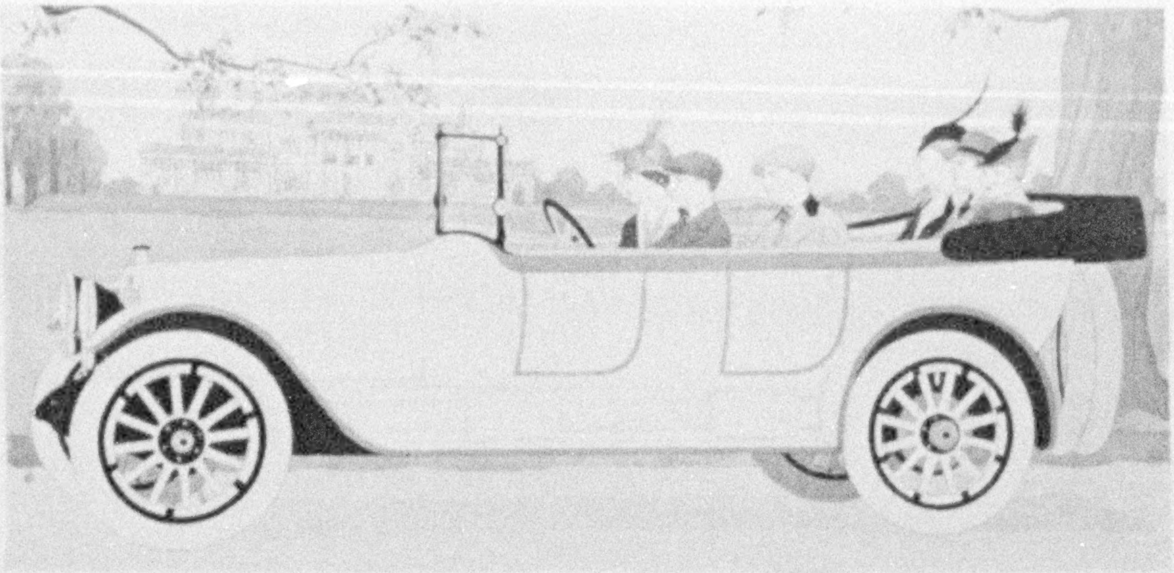

Just so Long as People have Eyes

they will always pay admiration to beauty. And it is a great error to buy a car lacking this distinction. Beauty never requires apologies, nor explanations. It is accepted everywhere at face value, as proof of quality, because *only those makers who take the time to build excellent cars ever take the additional time to make them really beautiful.* Commonplace cars look monotonously alike, and that monotonous repetition defeats beauty. But the genuinely superior car, designed and finished to meet the exclusive personal taste of its individual buyer, stands out cheerfully as the well-built and carefully selected possession of one who is accustomed to the good things of life. The visible beauty of his car is in harmony with its mechanical excellence. You can have everything that is desirable in a motor car when you order a Winton Six. Let us talk it over with you.

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Power—Ample to take this car, loaded, anywhere that any automobile can go.

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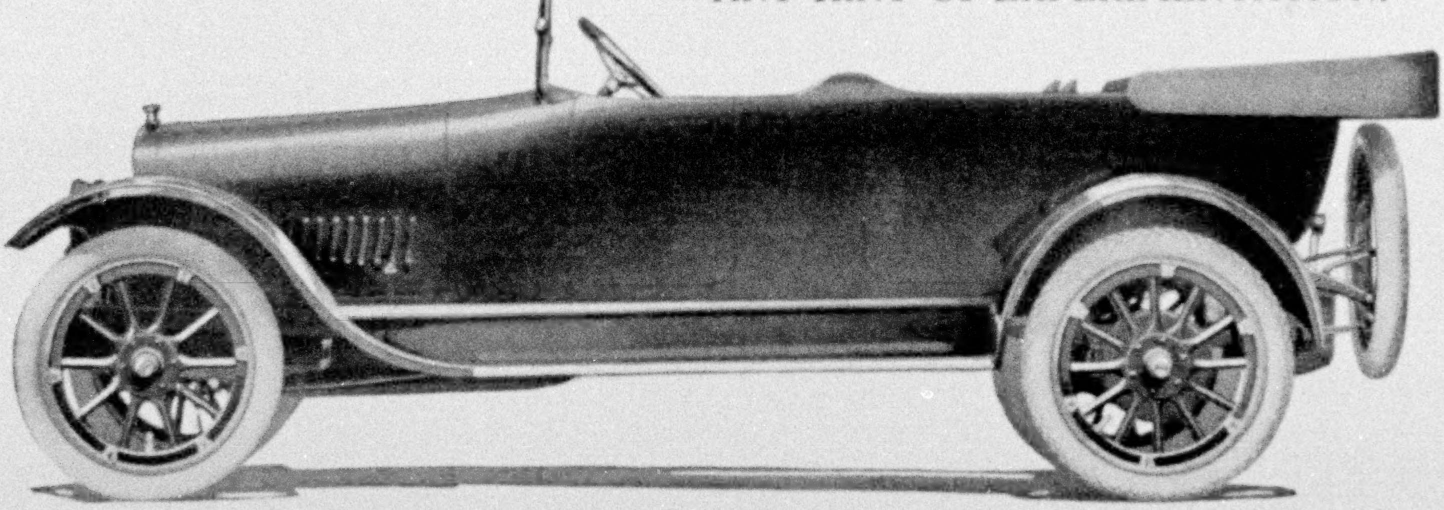

Most Beautiful of All the New Motor Car Bodies

EVERY ONE knows the Chandler now, from the mechanical standpoint. Every one knows how the Chandler, the pioneer light six and the first high-grade six to sell for less than $2000, has made good right from the beginning. Now we want you to know the handsome new Chandler bodies

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EQUIPMENT—Highest grade equipment is a feature of the Chandler now, as always, including Bosch High Tension Magneto, Gray & Davis separate unit Electric Starting and Lighting System, Chandler aluminum crank case, Chandler full-floating silent spiral bevel-gear rear axle, silent chain drive for motor shafts, annular ball bearings, Stewart-Warner magnetic speedometer, Stewart vacuum gasoline feed, non-skid tires in rear, and all the usual incidental items.

The new Chandler Catalogue illustrates the new big Touring Car, the Four-passenger Roadster, other body types, and all mechanical features fully. If you do not know your Chandler dealer, write us today

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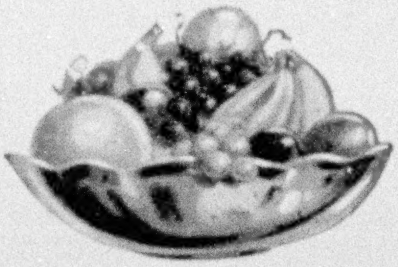
The Centerpiece at Breakfast

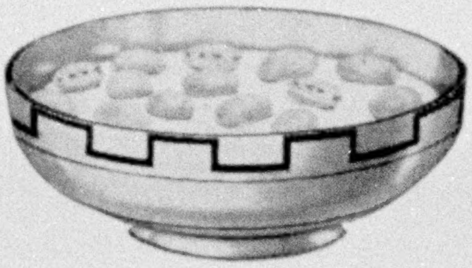
It's the Flowers

Says the lady of the house. What would breakfast be, at any season, without blossoms on the table?



It's the Fruit

Says the man. The fruit, the eggs, and the coffee. And many men, they say, make a centerpiece of the newspaper.



But the Children

to a unit, agree on Puffed Wheat. That is proved wherever people try it. With cream and sugar, or in bowls of milk, Puffed Grains are their breakfast bonbons.

Look at those floating bubbles.

Each is a grain of wheat puffed to eight times normal size. Each is flimsy, airy, crisp.

Each is a toasted tit-bit, flaky and fascinating, yielding an almond flavor.

Think of serving such bits by the bowlful—dainty food confections. Children revel in such things, of course.

Puffed Wheat 12c
Puffed Rice 15c
Except in Far West
Corn Puffs—Bubbles of Corn Hearts—15c

Puffed Rice, like Puffed Wheat, is whole grains with every food cell exploded. This is done for ease of digestion—to make every food atom available. That never was half-way done before this process was invented.

Add to all the delights that hygienic fact.

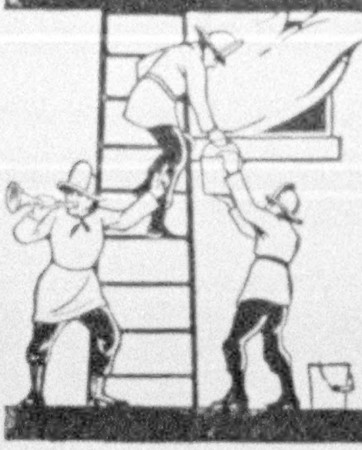
You'll agree, we believe, that these three cereals should largely be served as Puffed Grains.

There are no other like foods in existence.

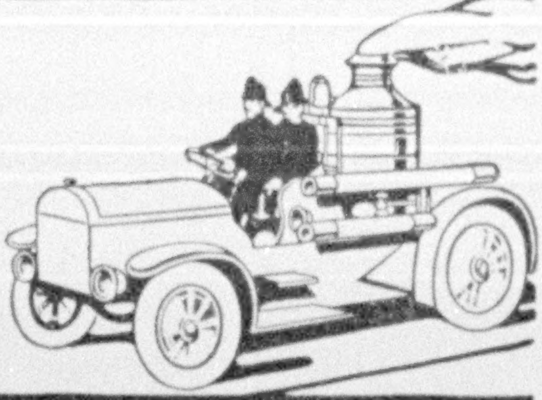
The Quaker Oats Company

Sole Makers

(1176)



From bucket brigade to auto-engine



On the first policies issued by the Hartford Fire Insurance Company there is a quaint steel engraving that gives an interesting picture of the primitive fire-fighting methods of 1810. A crude, hand-operated pumping apparatus stands before a blazing three-story dwelling, while a bucket-brigade of 50 men is required to supply the water for one feeble stream.

Rather a contrast to the modern 100 horse-power auto engine rushing at express train speed to the scene of the fire, there to supply a dozen hose lines with inexhaustible, high-pressure streams. Yet this contrast is no more striking than the difference between the first hesitating steps in the development of the Hartford Fire Insurance Company and the present complete and comprehensive

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OF THE
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The Hartford Fire Insurance Company in all its 105 years' history has been in the forefront of every sound, progressive movement for better fire insurance protection. As a result it does today the largest fire insurance business in the country.

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The two companies, between them, write practically every form of insurance but life insurance.

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Hartford Fire Insurance Co.
Hartford Accident & Indemnity Co.
Hartford, Conn.

COUPON—CHECK—TEAR OFF—MAIL

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Gentlemen:

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☐ Accident	☐ Burglary	☐ Hail	☐ Marine
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☐ Auto Liability	☐ Workmen's Compensation	☐ Parcel Post	☐ Teaming
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☐ Baggage	☐ Race Horse	☐ Live Stock	☐ Explosion

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1½ ton (chassis only)	1685
2 tons (chassis only)	1985

DENBY MOTOR TRUCK COMPANY

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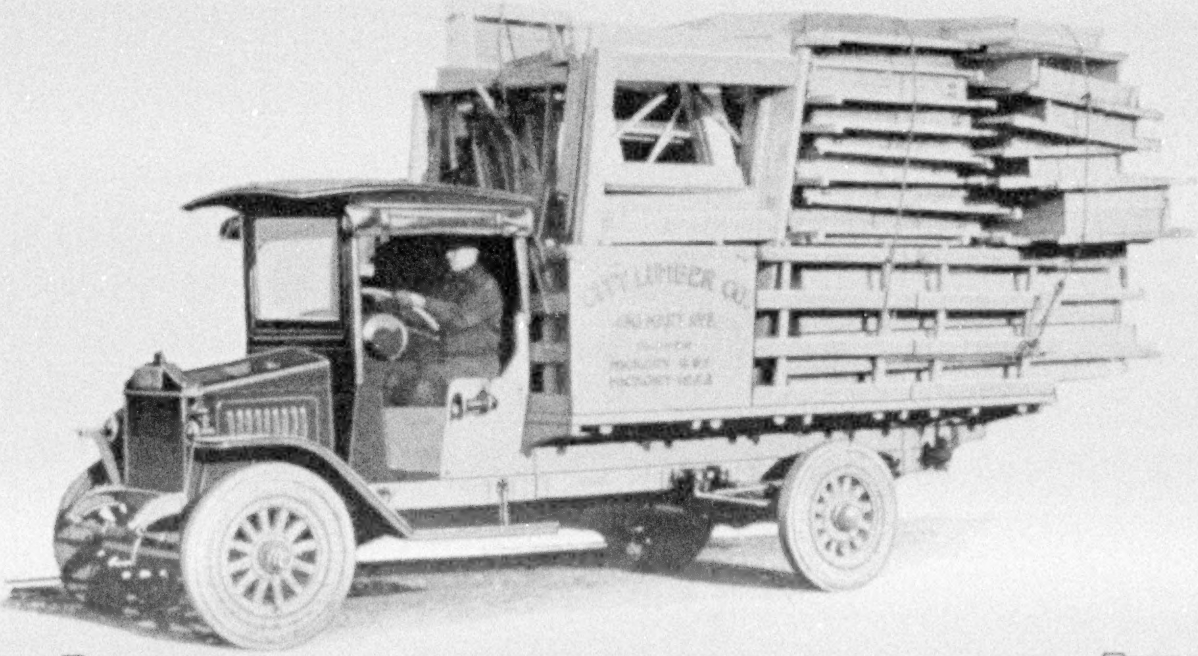

DENBY · 2-TON DENBY HAULING LUMBER · DENBY

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EVERY bit of charming color that you see, whether at home or abroad, invites you to use the Hicro Camera. For by no other camera can you capture the color of the subject and fix it permanently on paper prints, as many as you want. The

Hess-Ives Hicro Camera

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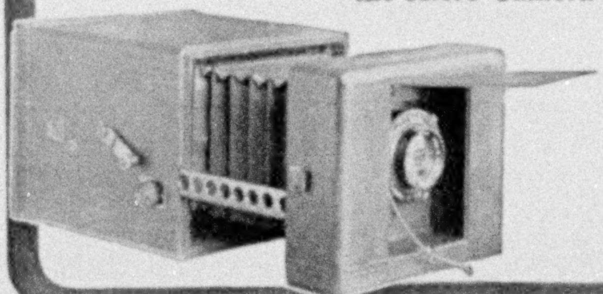

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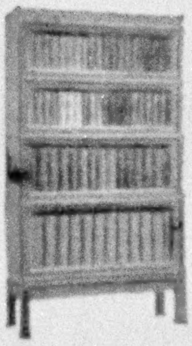

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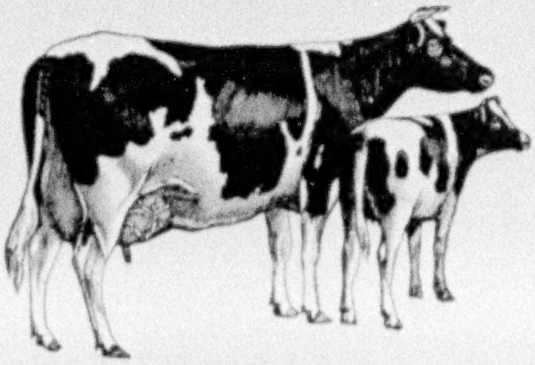

HOLSTEIN-FRIESIAN ASSOCIATION OF AMERICA
F. L. HOUGHTON, Secretary,
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Kelly-Springfield
Automobile Tires-Hand Made

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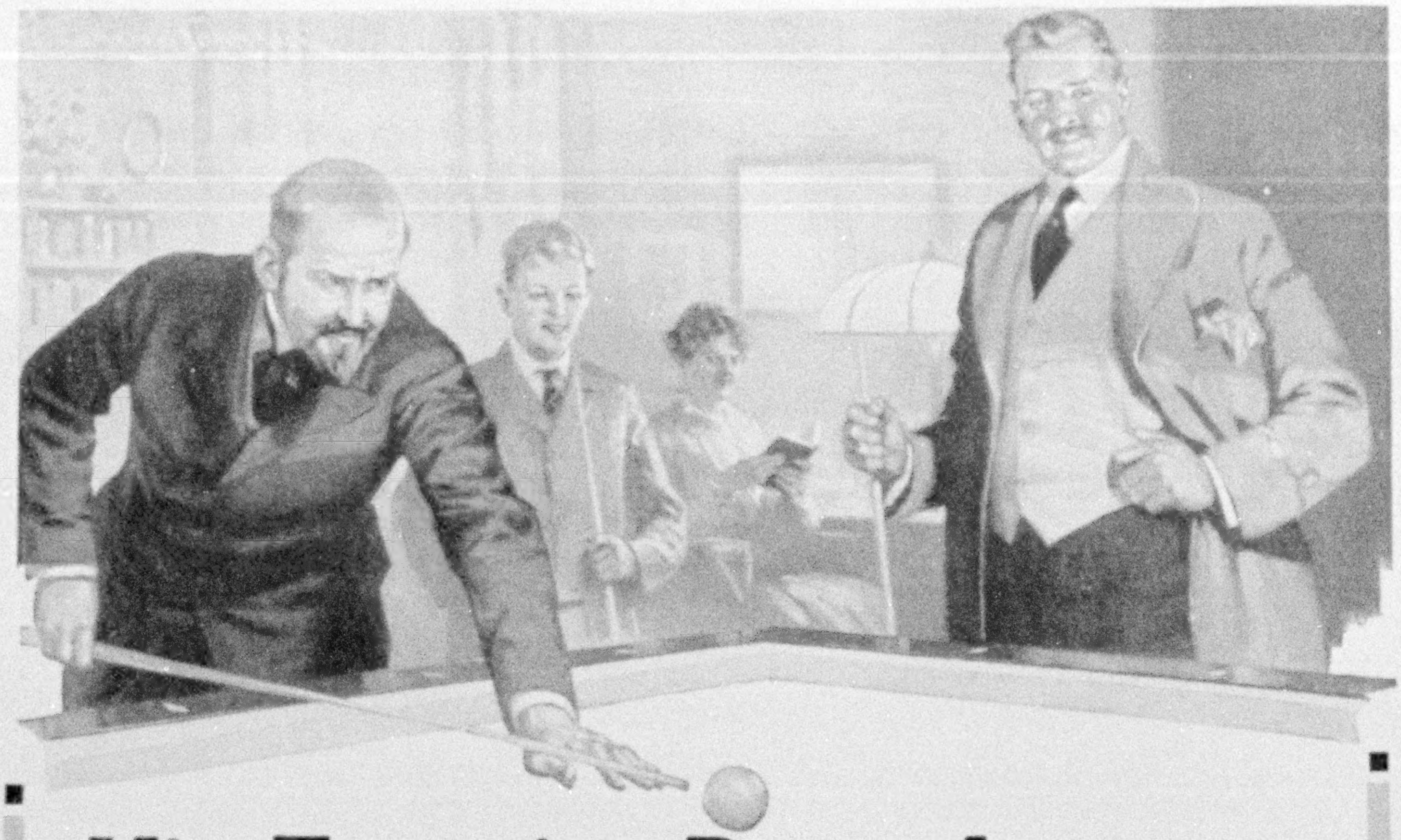
Kelly-Springfield Tire Co.

Factories in Akron and Wooster, Ohio

Executive Offices:

Broadway and 57th St., New York

Send ten cents for the new game, "Going to Market"



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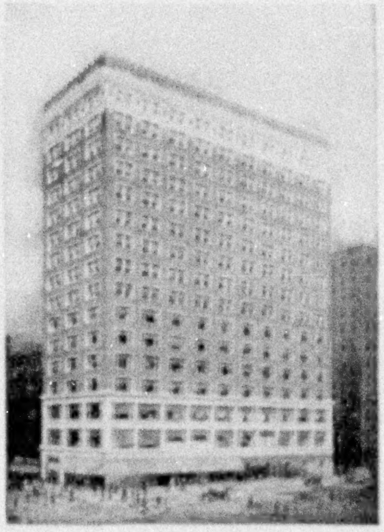

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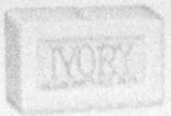

IT FLOATS

$99\frac{44}{100}\%$ PURE

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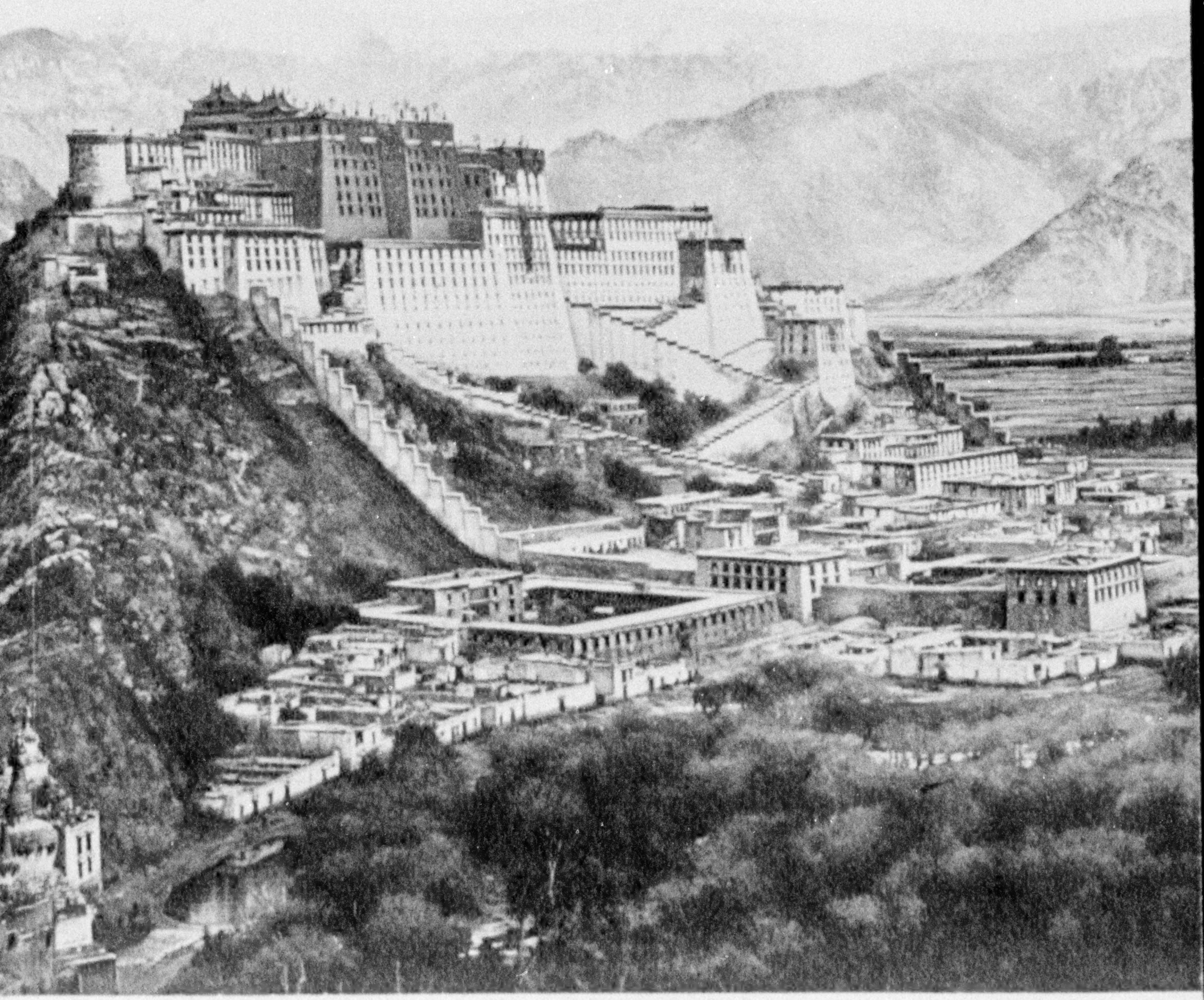
Gilbert H. Grosvenor, *Editor*



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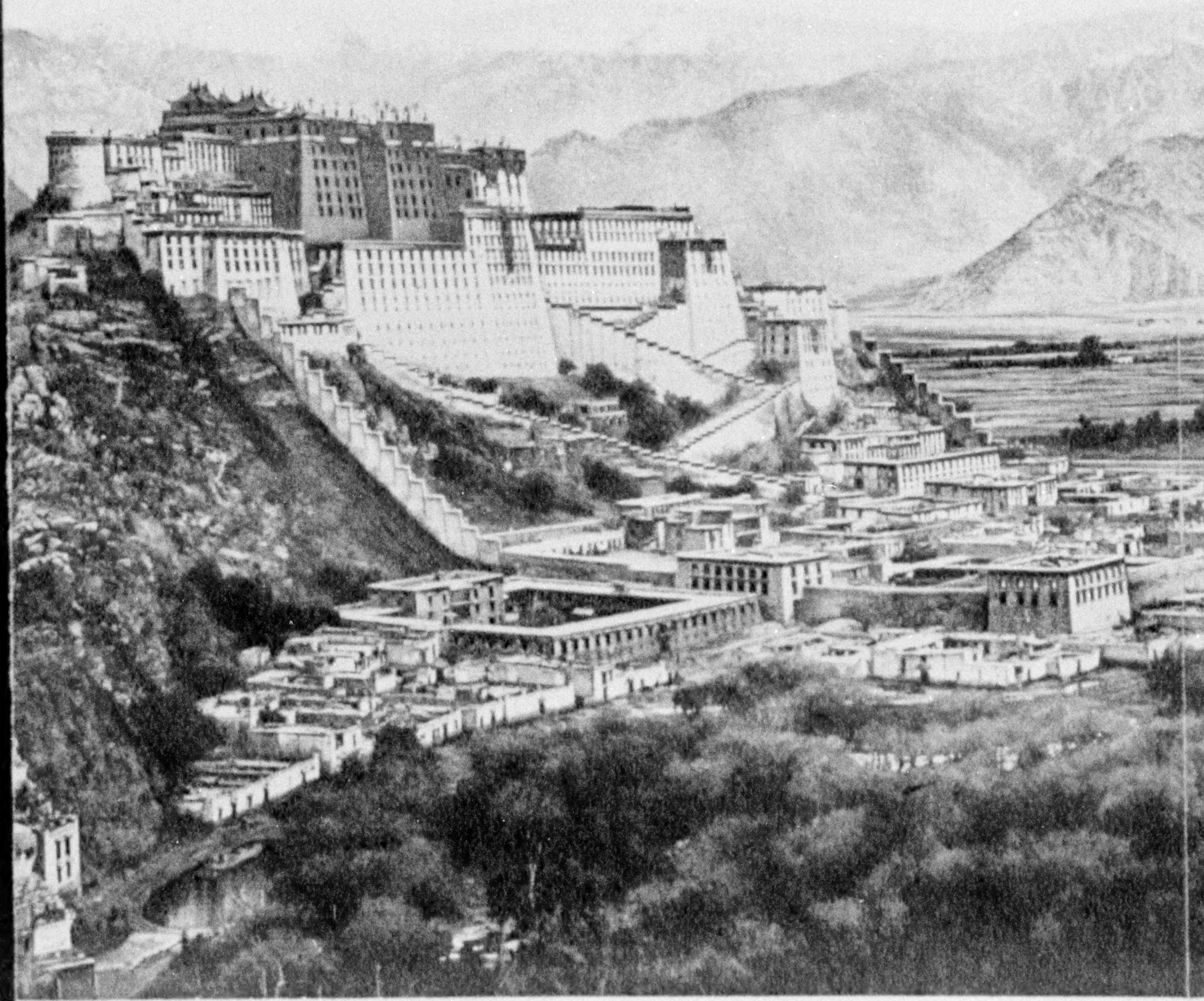

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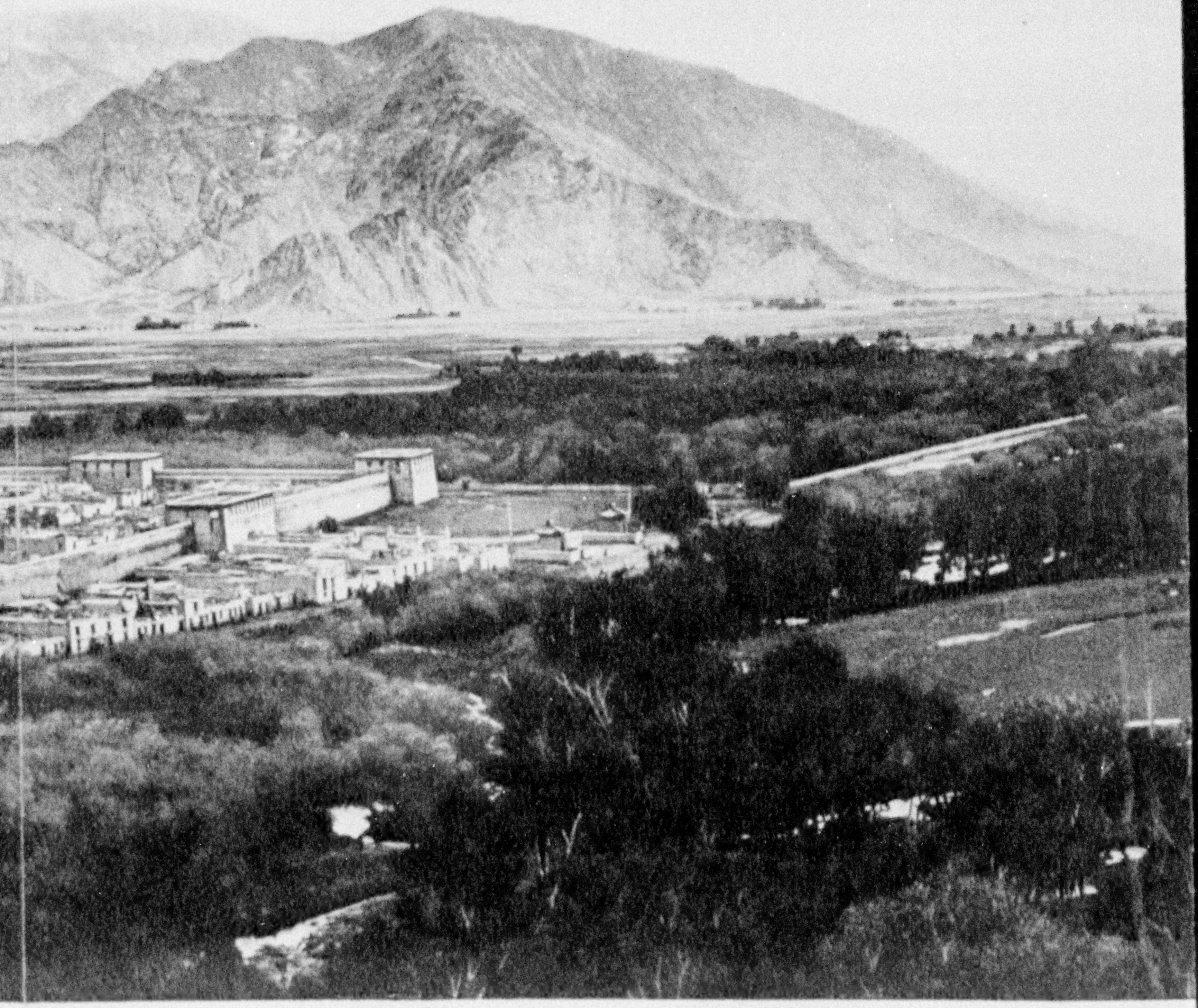

LHASA—THE MECCA OF THE BUDDHIST FAITH

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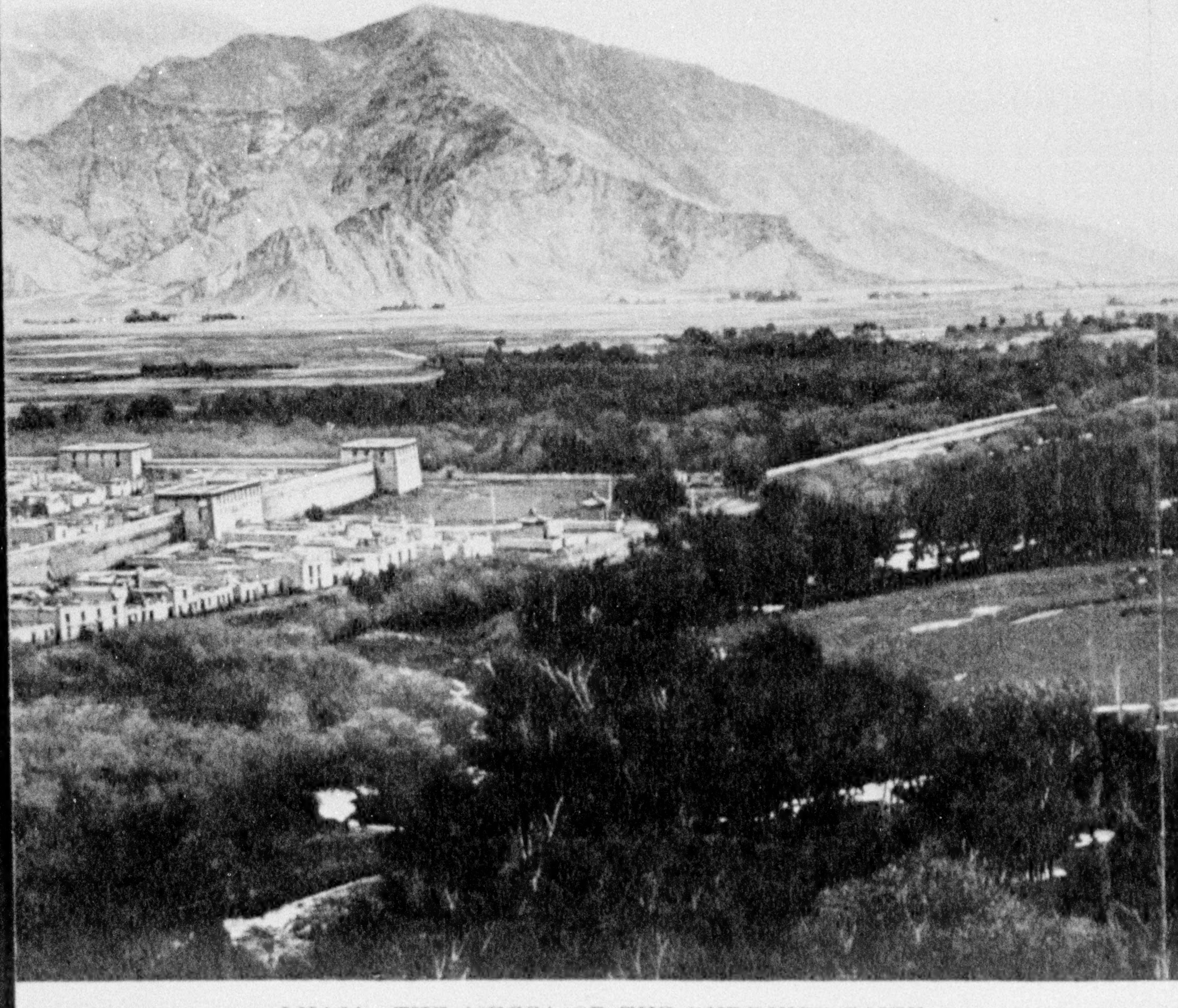

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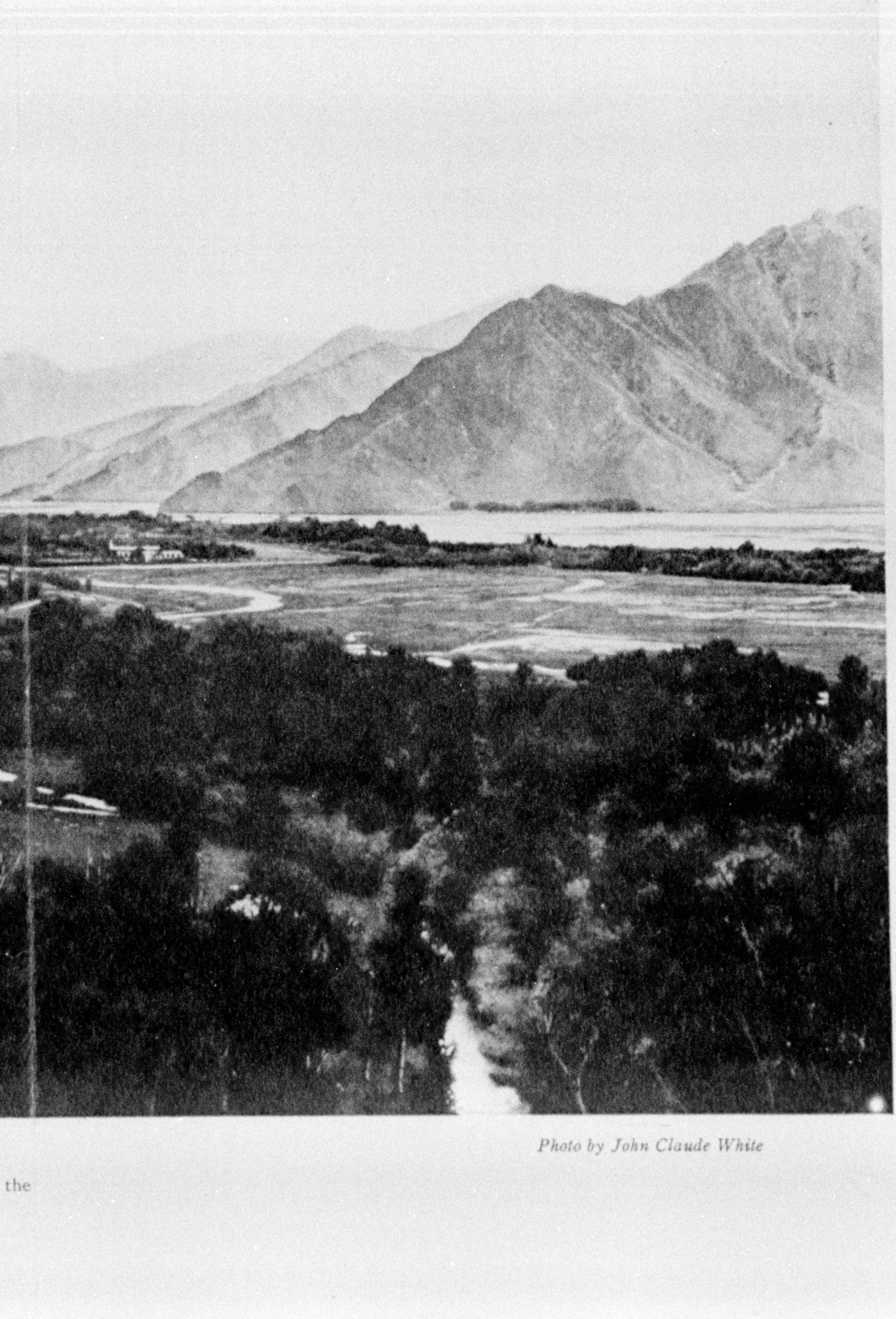

Photo by John Claude White

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VOL. XXIX, NO. 3 WASHINGTON MARCH, 1916

THE NATIONAL GEOGRAPHIC MAGAZINE

GREAT BRITAIN'S BREAD UPON THE WATERS: CANADA AND HER OTHER DAUGHTERS*

By William Howard Taft

THE strain of the great war now raging is a test of the character of the peoples engaging in it, and of the institutions to which they have committed themselves and in behalf of which for decades and centuries they have labored. It places their ideas of government and their philosophies of the life in a crucible under the intensest heat. It is no respecter of preconceived theories, and it lays bare weaknesses that were not suspected. The war has shown a high spirit of patriotism and self-sacrifice as the common trait of all those engaged in it.

In England the war has betrayed the delays and blunders in the beginning of a war which it seems impossible to avoid in a parliamentary government.

England's course in this war has confirmed the view that if war is to be a normal condition of national and international life, popular government, with a free press and unrestrained public opinion, is not the best form adapted to act quickly and to overwhelm an enemy.

Its inherent disadvantage in the outset of a war is not only a reason why it should avoid war when it can do so with honor and without national sacrifice, but it is also a reason why it should in time of peace make every reasonable preparation for national defense consistent with individual liberty and the control of the people.

It is not true that popular government unfits a people for war, saps their unselfish patriotism, or dulls their willingness to make the sacrifice. The armies of France raised in the wars of the French Revolution refute any such notion. Our own Civil War shows that participation in government and the consequent sense of ownership in it prompt the highest spirit of sacrifice for the country.

Many counsels in a democracy may confuse or may prevent the needed concentration of power in one competent leader or body of leaders to produce wise and quick action, but the fault is not in the willingness or capacity of the citizens to make good soldiers. Training in popular government and traditional love of civil liberty stir the souls of men to costly conflict, even when their material interests and their opportunities for evading its sacrifices tempt them to withhold their aid.

THE LESSON WHICH THE AMERICAN REVOLUTION TAUGHT GREAT BRITAIN HAS BEEN WORTH ALL IT COST HER

We find such an instance in the conduct of the people of Canada, Australia, and South Africa, under the wise and generous treatment of them by Great Britain, their mother country, for half a century. It is a pleasure for a student of popular constitutional government to

*An address to the National Geographic Society, February 11, 1916

THE EMPEROR FALLS

What more inspiring sight than after hours of climbing over precipitous mountain trails and hearing the roar of falling waters in the distance to come suddenly into view of a waterfall like this? The little Grand Forks River, which pursues its tortuous way through the wild Mount Robson region of British Columbia, is a series of scenic surprises, not the least of which is this beautiful fall.

dwell upon this and trace out the reason for it.

It is possible for us, who are not involved in this war and who occupy a neutral position, to do justice to the noteworthy exhibition of admirable qualities in all the belligerents without exposing ourselves to the charge of partisanship or prejudiced sympathy; and it is with that attitude and from that standpoint that I invite your attention to the consideration of the vindication of England's policy in the autonomous governments under her, which constitute a part of her so-called empire.

Through the blindness of George III, and against the judgment of the more liberal statesmen of his reign, the American colonies were lost to England. That they had originally, all of them, a warm affection for the mother country and a pride in their relations to her is clear; that the course which George III and his ministers took in dealing with them was ill-advised and unjust and altogether lacking in prudence and tact, the modern English historians are now the first to admit; that the grievances of which the colonies complained were perhaps not as acute and oppressive as we have been taught in our school histories to believe may be true.

It suffices to say that, however weighty or otherwise those grievances were, they were at least enough to instil in the minds of a people who had enjoyed practice in self-government, through neglect of the mother country for 100 years, a vision of independence and a desire for it that, once developed, precluded the possibility of a resumption of British control. The lesson which the war of the American Revolution taught to Great Britain has been worth all it cost her.

OLD GRIEVANCES ARE NOT FORGOTTEN

The spirit of revenge in which we dealt with the Tories who were loyal to England in our struggle, and the confiscation and the suffering to which we subjected them, drove a body of people into Nova Scotia and into Upper Canada numbering 40,000. England sought by the appropriation of 3,000,000 pounds to salve the wounds of these United Empire loyalists. Their feeling of enmity toward the United States, handed down by tradition, has had a real effect to prevent the union of Canada with this country. Their attitude was confirmed in the War of 1812.

Under the Constitution of 1791, which divided Canada into two provinces, Upper and Lower, each had a legislature with a council which the legislature did not control, under a British governor. This system lasted for 50 years, but it proved unsatisfactory. A "family compact" of ultra Tories in the council ruled Upper Canada and defied and bullied the legislature.

In Lower Canada, where the French lived, England had, by the Quebec Act of 1774, satisfied their race and religious sentiment by assuring to them a continuance of their civil law and customs and the maintenance of the quasi-political status of their church. This prevented the French from joining the American Revolution and retained Canada for England.

A BRILLIANT STATESMAN

The promise has been faithfully kept. Still the constitutional act did not work well with the French any more than with the English. So it was that in 1837 the Frenchman Papineau in Lower Canada and the Scotchman MacKenzie in Upper Canada sought to overthrow their respective governments by force. These rebellions were easily overcome, but there remained for the home government the burdensome task of solving what seemed an insoluble problem of restoring peace and order among a dissatisfied people, half English and half French.

Lord Melbourne and his associates prevailed on the Earl of Durham to undertake the task. The selection was fortunate for Canada and fortunate for Great Britain, although the immediate result of his short incumbency was apparently a humiliating failure. Lord Durham was one of the great statesmen and the great radical reformer of his day.

He entered Parliament at 21, and long before they really became the burning issues he was advocating Catholic emancipation, a reform of representation in Parliament, extension of the franchise, and a repeal of the corn tax.

Photograph by Gilbert H. Grosveno

A FAMILY OF NINE SONS: BADDECK, CAPE BRETON, NOVA SCOTIA

This family will soon be able to have a baseball team all its own. From Cape Breton Island have come many of the most loyal naturalized citizens of the United States. To our merchant marine on the Great Lakes this little island has probably contributed more captains and first mates than any other part of the world.

He was the son-in-law of the great Earl Grey and was the real draftsman of the great reform laws of 1832. He was hot-tempered, vain, impatient of criticism, and entirely unrestrained in the expression of his real opinions and in that diplomacy which would have given him far greater influence in the politics of his day. He was regarded by the people of England as their friend and representative, when the people were not as powerful as they are now. He was excluded from ministries because it was thought that no ministry could get along with him, however much their policies agreed in general outline with his.

When Lord Melbourne and Lord John Russell asked the Earl of Durham to go to Canada he was most reluctant to do so; but the ministry, Lord Melbourne, and others pledged themselves to back him in every way and gave him almost unlimited power to deal with the situation. When he reached there, he found it impossible to convict the rebels among Papineau's followers before a French jury, and finally they were induced to admit their guilt. He pardoned all but Papineau and a dozen others, against whom he entered a decree of exile to the Bermudas, with a penalty of death if they returned.

This disposition of the cases was well received in Canada and was approved in private letters of Melbourne and the other ministers. Lord Brougham, however, who was then in the House of Lords and the bitter enemy of Durham, contended that this was contrary to the British constitution and wholly beyond Durham's authority. He was supported by Lord Ellenborough. The ministry ignominiously deserted Durham, repudiated his action, and acquiesced in Brougham's demands. Durham at once resigned and returned to England after five months' service. The government studiously refused to give him the ordinary courtesies that a returning governor general was in the habit of receiving. His figure was a pathetic one. He was but 48 years of age, with an ability second to none in England; but his life seemed a complete failure and within two years he died—a broken-hearted man.

A REMARKABLE STATE PAPER

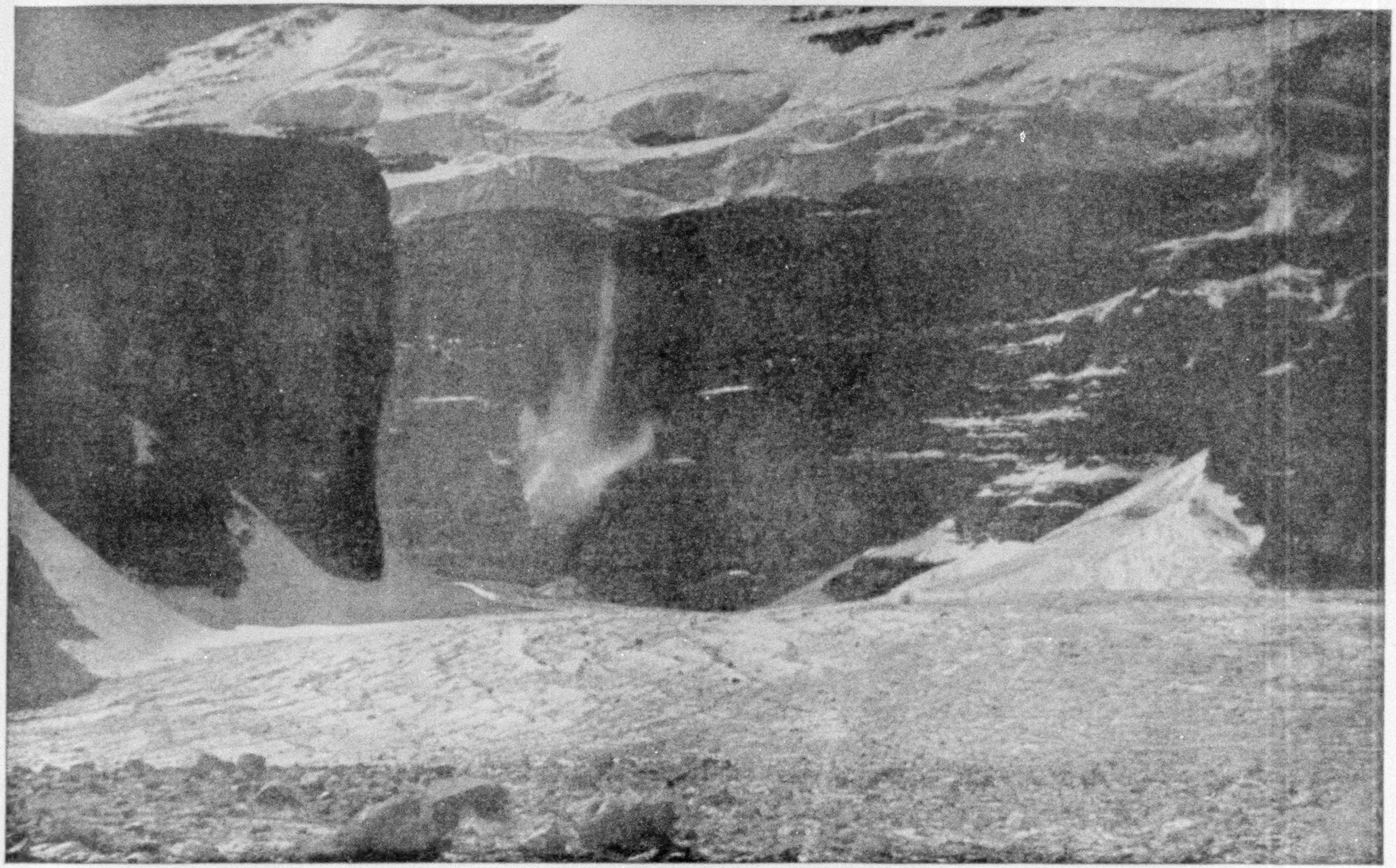
During his five months, however, he had seen clearly into the difficulties of Canadian government, and left a report which has been pronounced by high authority to be one of the greatest state papers in British history, and which really has been the basis of the highly successful policy pursued by Great Britain since in dealing with those peoples who have remained a part of her so-called empire, but who have inherited, because of their Anglo-Saxon origin, their love of popular government and of individual liberty.

He recommended that the Upper and Lower Canadas be governed by a single Parliament and with local self-government for each province, and he foreshadowed the union of all of the British provinces in North America. He urged the adoption of responsible government—that is, the executive control by the leaders of the majority in the legislature. He said: "The Crown must submit to necessary consequences of representative institutions, and if it has to carry on the government in union with a representative body, it must consent to carry it on by means of those in whom that representative body has confidence."

He said: "The constitution of the government, the regulation of foreign relations and of trade with the mother country and the other British colonies and foreign nations, and the disposal of the public lands are the only points on which the mother country requires control."

Local municipal government, in Durham's view, bore an important relationship to general government. He had noted the absence of adequate municipal institutions in Lower Canada. He said: "A general legislature which manages the private business of every parish, in addition to the common business of the country, wields a power which no single body, however popular in its constitution, ought to have—a power which must be destructive of any constitutional balance."

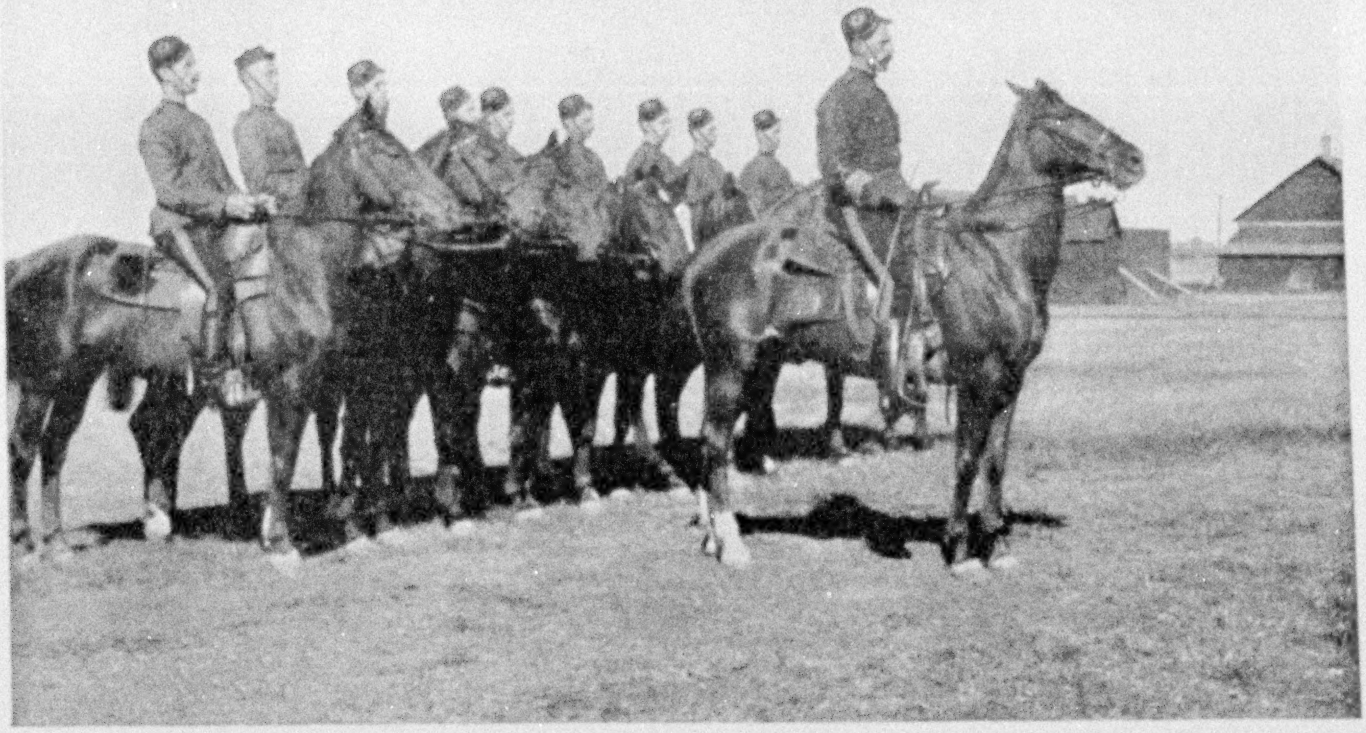
He thought that by establishing an adequate system of local government the general government would be relieved of those matters which are not its proper



Photograph by Mary Vaux Walcott

AN AVALANCHE IN THE CANADIAN ROCKIES

Opportunities for "snap-shotting" avalanches in action are not rare in the high mountains of western United States and Canada, but good photographs of them are. It requires an intrepid photographer to turn and calmly make a picture when the roar of great quantities of snow and rocks slipping down the precipitous mountain side is suddenly heard. Slightly to the left of the center in the picture above may be seen an avalanche on Mount Victoria, near Lake Louise, in British Columbia. In the foreground is the Victoria Glacier, to the surface of which this avalanche is falling from the top of the cliffs, 1,800 feet above.



Photograph and copyright by Underwood & Underwood

A TROOP OF NORTHWEST MOUNTED POLICE: REGINA, SASKATCHEWAN, CANADA

For individual bravery, dashing horsemanship, and general all-around ability for keeping order in unruly territory, the Canadian Northwest Mounted Police have established an efficiency record that would be extremely difficult for a similar organization to equal. Through their efforts there is a wholesome fear of the law in the most outlying districts, for the man who commits a crime in the most remote section of the wilderness feels sooner or later the hand of one of these troopers upon his shoulder.

concern. Moreover, by taking part in the responsibilities of local government, citizens would secure a training which would fit them for the better discharge of the duties of general administration.

In all these respects the report of Lord Durham was followed by the British Parliament in its Union Act of 1840. In one respect they did not yield to Durham's advice. Durham recommended the denationalization of French Canada, advocated the gradual substitution of the English for the French language, and the making of Quebec an English province by methods that would today be regarded as coercive. He thought this was essential for the strength of the colony as a British possession. The guaranties of the Quebec Act of 1774 were, however, not departed from.

The first Parliament of the United Canadas met in 1841. The act provided for a legislative council of 20 members and a legislative assembly of 84 members and gave to the two provinces (Upper and Lower Canada) equal representation in each body.

ALL THE CANADIAN PROVINCES BECOME UNITED

Under this act Canada proceeded to real self-government. Her legislature took complete control of the civil list in the post-office and freed her from all interference by the imperial government in all matters affecting her trade and commerce, including the previous imperial legislation which had imposed duties on goods imported from foreign countries into the colony and had prevented the free dealing between Canada and other nations.

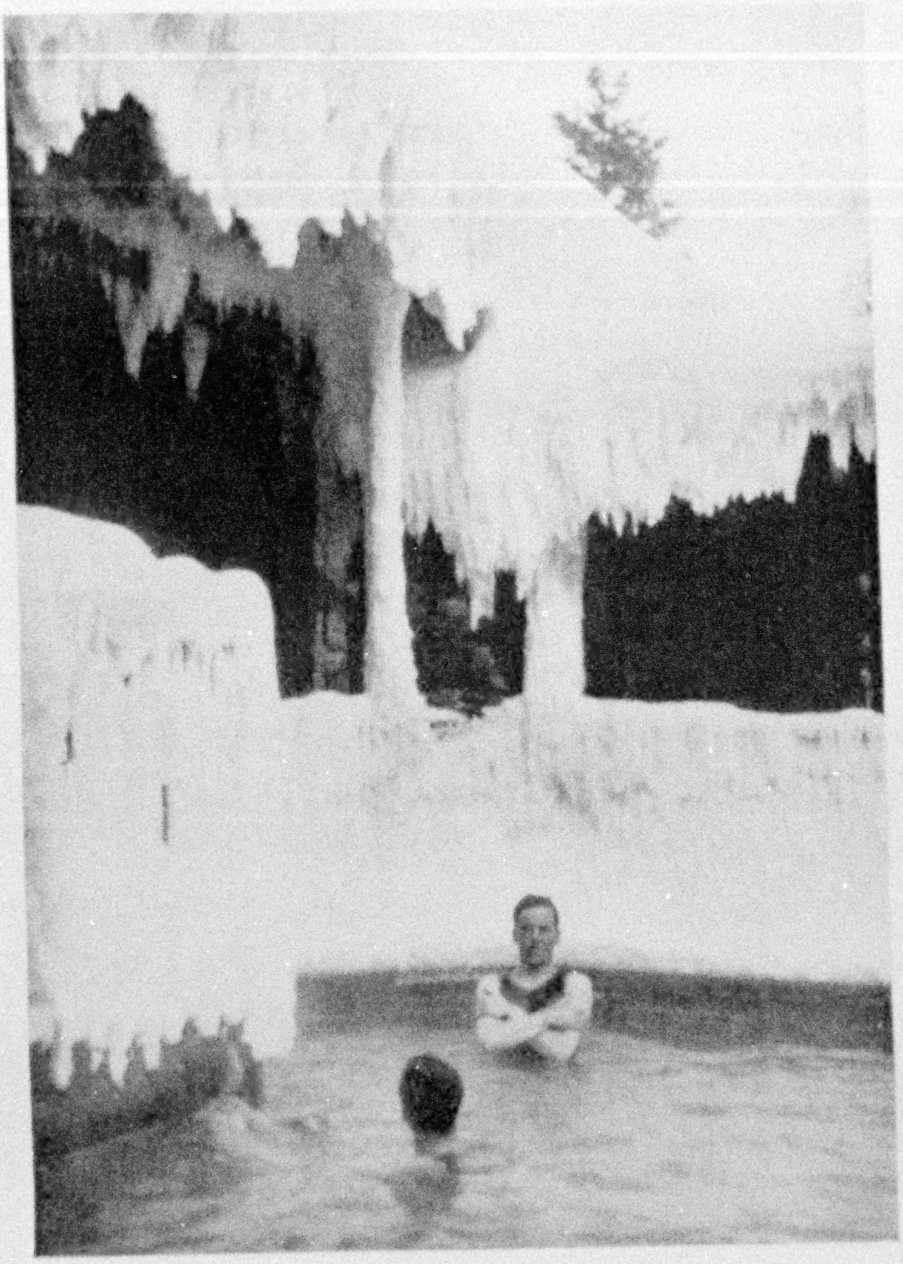
Lord Durham was succeeded by Lord Sydenham, and after him came Lord Elgin. These statesmen carried on the government under the Union Act with

REAPING WHEAT ON THE PLAINS OF ALBERTA, CANADA: THESE GREAT PLAINS ARE A CONTINUATION OF OUR OWN ROLLING PRAIRIES

marked ability and with very considerable success; but the growth of Canada was not responsive to the hopes of her people or of England, and it was conceived that a change was necessary looking to a closer union of all the British colonies of North America, including Nova Scotia, New Brunswick, and Prince Edward Island, as Durham had advised and foreseen.

One of the two parties adopted a platform of federation in 1858, but it took nearly ten years to carry the proposal to a successful issue. A convention for this purpose met at Quebec in 1864, consisting of 33 delegates. The convention sat for 18 days behind closed doors and left no official record of its deliberations.

The members had clearly in mind the Constitution of the United States and the history of that Constitution as a field in which they might find guides for their conduct. They represented both political parties, but in their deliberations they subordinated temporary political advantage to the patriotic purpose of reaching an agreement upon a government that should give opportunity for great national growth and development.



WINTER BATHING: BANFF, ALBERTA

Water sports under such conditions would suggest that all the comforts of home were conspicuous by their absence. However, the sulphur springs for which Banff is famous maintain a uniform temperature of 110 degrees throughout the year. Therefore, while the atmospheric temperature may approximate zero, the water is very warm and pleasant for the bather—who keeps below the surface!

The secret deliberations in such a crisis, as in our Constitutional Convention, led to the expression by the delegates of their real convictions; shortened the debates, because they did not talk for buncombe, and brought in the short space of less than three weeks a solution of what had seemed a very difficult problem.

The men who most contributed to this end were John A. McDonald, George Etienne Cartier, and George Brown. While Cartier and McDonald had been together as political associates, they represented different elements, Cartier being a representative of the French Canadians and McDonald a representative of the English and Scotch conservatives, while Brown represented the liberal English and Scotch voters.

The success in its way was as notable as that of our own Constitution, in the wise compromises that were effected and in the sacrifices of personal opinions and notions that the compromises necessitated.

The successful launching of the new government proposed was attended with difficulties. The smaller provinces of

Photograph by Gilbert H. Grosvenor

VIEW OF THE BRAS D'OR LAKES, NEAR BADDECK, CAPE BRETON

Photograph from Lieut. W. K. Harris

TIMBER FROM THE SLOPES OF MOUNT WARNING: NORTH COAST DISTRICT, NEW SOUTH WALES

Conservation of forest resources is a problem which has long confronted the governments of the various Australian States, for the early settlement of the more heavily timbered regions was characterized by a waste of much valuable timber. This problem has been well solved, however, by establishing numerous State forests, administered in very much the same way as our own national forests.

XUM

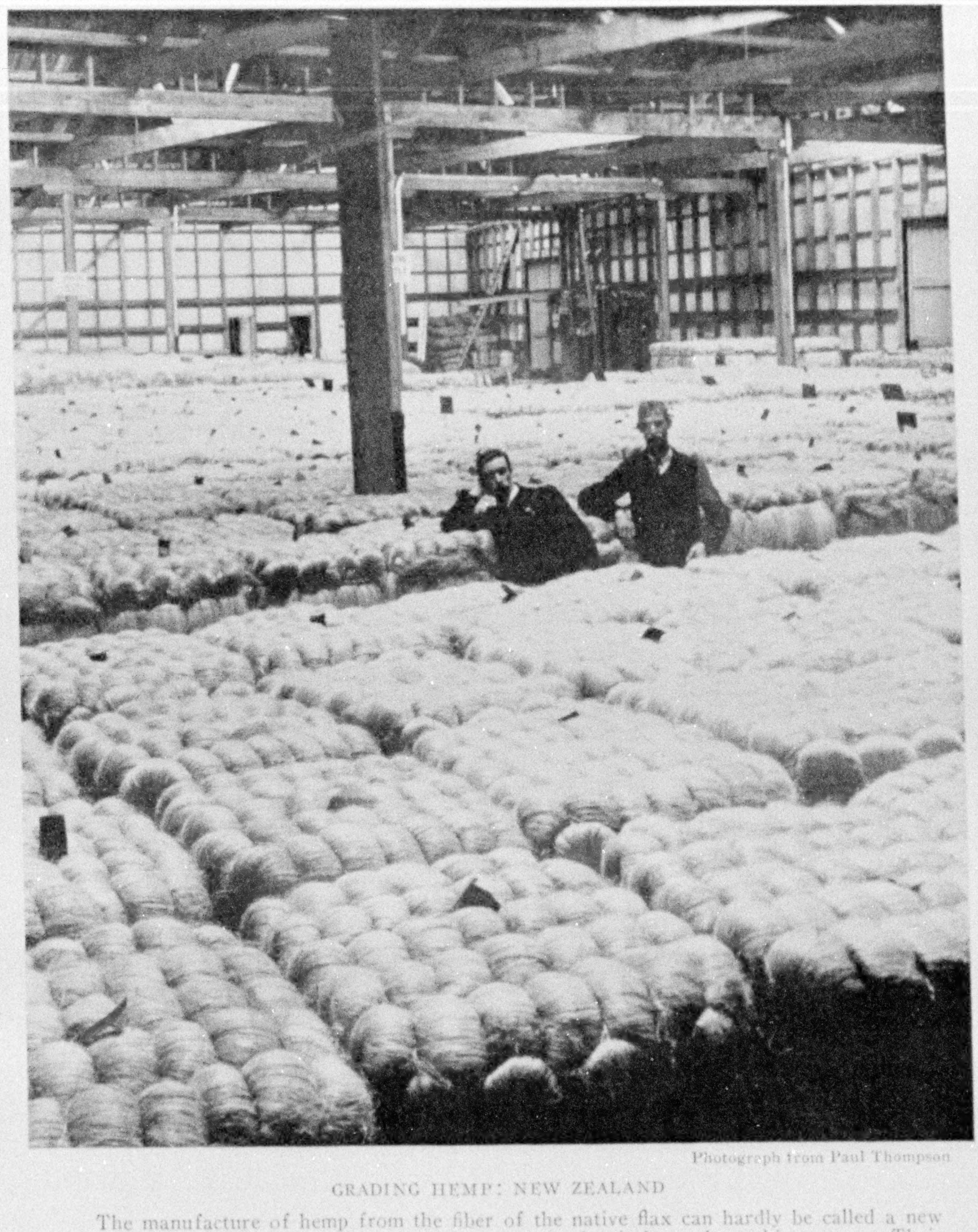
Photograph from Government Publicity Department, Sydney

GEORGE STREET, SYDNEY, NEW SOUTH WALES, SHOWING TOWN HALL

Sydney, the metropolis of New South Wales and likewise its capital, is an English city, although on every hand there may be seen American goods advertised for sale. This city, the oldest in Australia, was founded by Capt. Arthur Phillip in 1788 and is the continent's principal naval station. The deep water of its beautiful and nearly landlocked harbor is almost without shallows up to the edge of its rocky shores. With the possible exception of Melbourne, Sydney is the most important commercially of any of the British ports of the South seas. The city is in a particularly picturesque spot and notable for the many handsome public buildings, parks, and gardens, which, together with its wide, clean streets, give it the appearance of one of the more attractive European capitals.

Nova Scotia and New Brunswick were loath to accept the government proposed and were only brought in by an agreement that a railroad should be built connecting Halifax with Quebec. It is an interesting and somewhat singular fact that the later union of the far western provinces with the Dominion was also conditioned upon the establishment of communication by railway between Ontario and Quebec and the Pacific coast.

The statesmen and Parliament of the mother country assisted in every way the adjustment of the differences that arose in creating the Dominion and embodied in the British North America Act the result of the Quebec Conference. Prince Edward Island was incorporated in the



Photograph from Paul Thompson

GRADING HEMP: NEW ZEALAND

The manufacture of hemp from the fiber of the native flax can hardly be called a new industry in New Zealand, for her people have been trying it for at least thirty years. Their product has had an uncertain place in the world's market, however, for it is used as a substitute for manila, and when the price of that commodity was low New Zealand hemp was almost unsalable. In late years a great deal has been done to improve its quality and a market has been created for it. Much of it is sold to be spun into binder-twine, and the Japanese are said to be able to imitate silk with it.

Photograph from Lieut. W. K. Harris

CLEARING THE MALLEE SCRUB LANDS BY "ROLLING-DOWN" PROCESS: AUSTRALIA

When the brush is dry it is burned, and the land is then ready for plowing. "Mallee" is an evergreen shrub which grows as a short-stemmed bush in five or six shoots from one stump and reaches an average height of 12 to 20 feet. The trunk is seldom much thicker than a man's wrist, and it can hardly be called a tree, but it spreads with extraordinary closeness.

Photograph by A. Nielen

PET KANGAROOS: MELBOURNE, AUSTRALIA

Australia, which is the largest island or the smallest continent, depending upon how one desires to refer to it, is the habitat of many curious animals, the best known of which perhaps is the kangaroo. The weight of this strangely constructed animal is upward of 200 pounds when full grown, and in past ages scientists tell us was two or three times as large. One of its peculiarities is a pouchlike fold of the skin in which the female can carry her young. This, however, is not entirely confined to the kangaroo, but is a part of the equipment of about two-thirds of the mammals of Australia. There is a curious disproportion between the forward and rear quarters of the kangaroo, the fore feet and legs being very small and the hind legs of enormous size and strength. With these latter, assisted by a huge tail, the kangaroo makes its way by means of tremendous leaps across the grassy plains, where in earlier days it was found in great droves.

union in 1867. The British North America Act offered an opportunity for the western provinces to come in as the Dominion government should permit and require.

WHEREIN THE CANADIAN CONSTITUTION DIFFERS FROM OURS

The framers of the Constitution of Canada thought it an improvement on the Constitution of the United States, in that the defects which the latter was supposed to have shown in the Civil War were corrected. Sir John McDonald in his opening remarks at the Quebec Conference said of the situation when our Constitution was framed:

"There were 13 individual sovereignties, quite distinct the one from the other. The error at the formation of these constitutions was that each State reserved to itself all sovereign rights save small portions delegated. We must reverse the decision by strengthening the general government and conferring on the provincial bodies only such powers as may be required for local purposes."

I think it is the general opinion now

that this view of the Constitution of the United States was a mistaken one. The adoption of the 13th, 14th, and 15th amendments strengthened somewhat the restraint upon State legislatures enforceable in the Supreme Court of the United States, but generally the division of power between the States and the general government remained the same.

And yet, as our Congress has exercised powers which she always had, but which she had not before exercised, the strength of the central government is seen to be quite all that it ought to be. There is danger that a great widening of the field of Federal activity and a substantial diminution of State rights would in the end threaten the integrity of our Union instead of promoting it.

However, the Quebec Conference, fearing secession, took the other view, followed MacDonald's recommendation, and agreed that in the division of powers between the Dominion government and the provincial governments the residuum should be in the Dominion government, and not be reserved either to the provinces or to the people, as with us.

The Dominion Parliament is made up of a Senate composed of Senators appointed by the government for life and of a popular House of Commons.

Another very great difference between our Constitution and that of Canada is that, while the guaranties of civil liberty in our own Constitution are all express, as insisted on by Jefferson and Madison, though not thought necessary by Hamilton, they find such sanction as they have in the unwritten British Constitution, and are left not to the courts, but to the protection of an executive veto of provincial or dominion legislation. This really gives an opportunity for much more radical legislation in Canada with reference to vested rights than we have in this country. This may not be so important now as it will be later, when a revulsion against the danger of corporate political control and a plutocracy, which is likely to threaten Canada in the future, shall give rise to not only needed regulation and restriction, but also to such excessive and indiscriminate attack upon capital investment such as we have seen in some parts of this country.

AUSTRALIA LIKED OUR CONSTITUTION BETTER THAN THE CANADIAN

It is a noteworthy significance that when the Australian Commonwealth was formed by the union of the various Australian States or provinces, about 1900, the Constitutional Convention followed more closely in the division of powers between the government of the Commonwealth and its associated and constituent States the principle of our Federal Constitution.

In other ways that Commonwealth followed our fundamental law more closely than Canada. Its Senate is made up by the equal representation of all the constituent States, and in the reserving to the States and to the people the residuum of power; so that the grants of power to the Federal government in Australia are to be construed as they are construed in our Constitution.

The framework of the fundamental law of Australia is based more on popular control than is that of Canada, and it is more independent of the mother country, in that the construction of its Constitution in the matter of the distribution of powers between the States and the Commonwealth is left to the Supreme Court of the Commonwealth, without a right of appeal to the British Privy Council except upon allowance of the Supreme Court, while in Canada a right of appeal in such cases is absolute.

SOME DIFFERENCES IN THE GOVERNMENT OF CANADA AND AUSTRALIA

A reason for the difference in the constitutions of Australia and Canada is doubtless found in the fact that the Canadian Constitution was adopted during the Civil War, when our Constitution seemed to have failed in securing power enough to the central government; and the Australian Constitution was adopted at the beginning of the 20th century, when our Constitution had shown itself able to weather the storms of secession and to authorize a central government continually increasing in strength with the growth and settlement of the country.

The difference in the manner of selecting the Senate, which in Canada, as

Photograph by Mary Vaux Walcott

TOWER OF BABEL, MORAINE LAKE, ALBERTA

Moraine Lake is reached by a drive of ten miles from Lake Louise. It nestles in the Valley of the Ten Peaks, at the base of the chain of mountains that give the valley its name. The Tower of Babel is a cliff at the north end of the lake, the higher mountains extending towards the southwest.

XUM

Photograph by Mary Vaux Walcott

MOUNT ROBSON FROM THE NORTH

The stream in the foreground flows into the Frazier River, and so on to the Pacific, while that behind the camera finds its way into the arctic watershed. A good trail leads from Robson Station to this point.

Photograph by Mary Vaux Walcott

BLUE, OR TUMBLING GLACIER, FED FROM THE VAST SNOW SLOPES OF MOUNT ROBSON

The tongue of the glacier as it is pushed down into the lake breaks off in numberless bergs, at the arch, thus giving the name—Berg Lake. The ice arch is very large and perfect.

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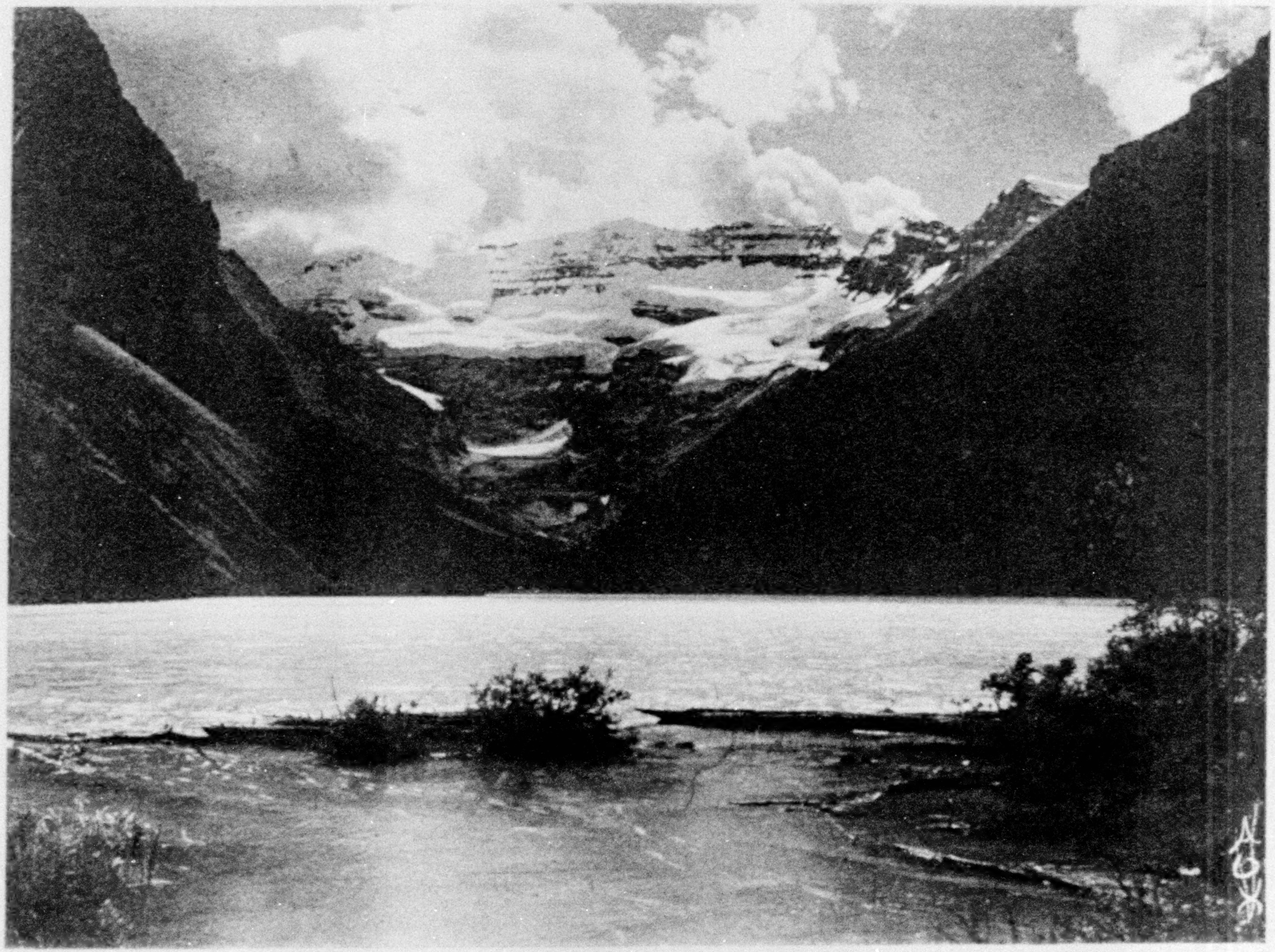
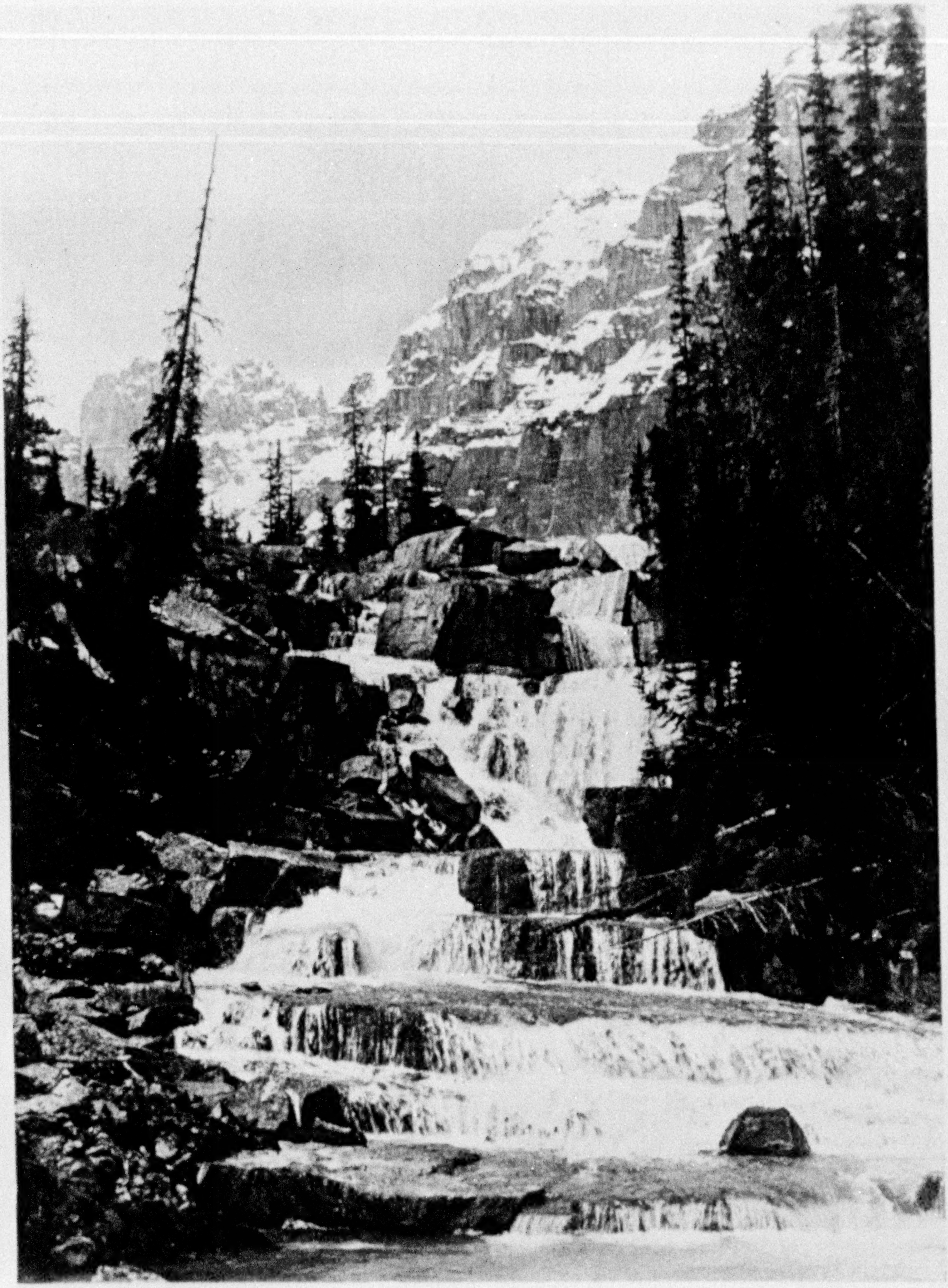


Photograph by George Vaux, Jr., and Mary Vaux Walcott

LAKE LOUISE, ALBERTA

The varied coloring, as well as the perfect surroundings of this wonderful lake, cause it to have an absorbing interest for the traveler who has the good fortune to visit it. Mount Victoria (altitude 11,355 feet) in the background is four miles distant as the crow flies, but the thunder of the avalanches of ice can frequently be heard at the Châlet. The altitude of Lake Louise is 5,670 feet.



GIANT STEPS IN PARADISE VALLEY, ALBERTA

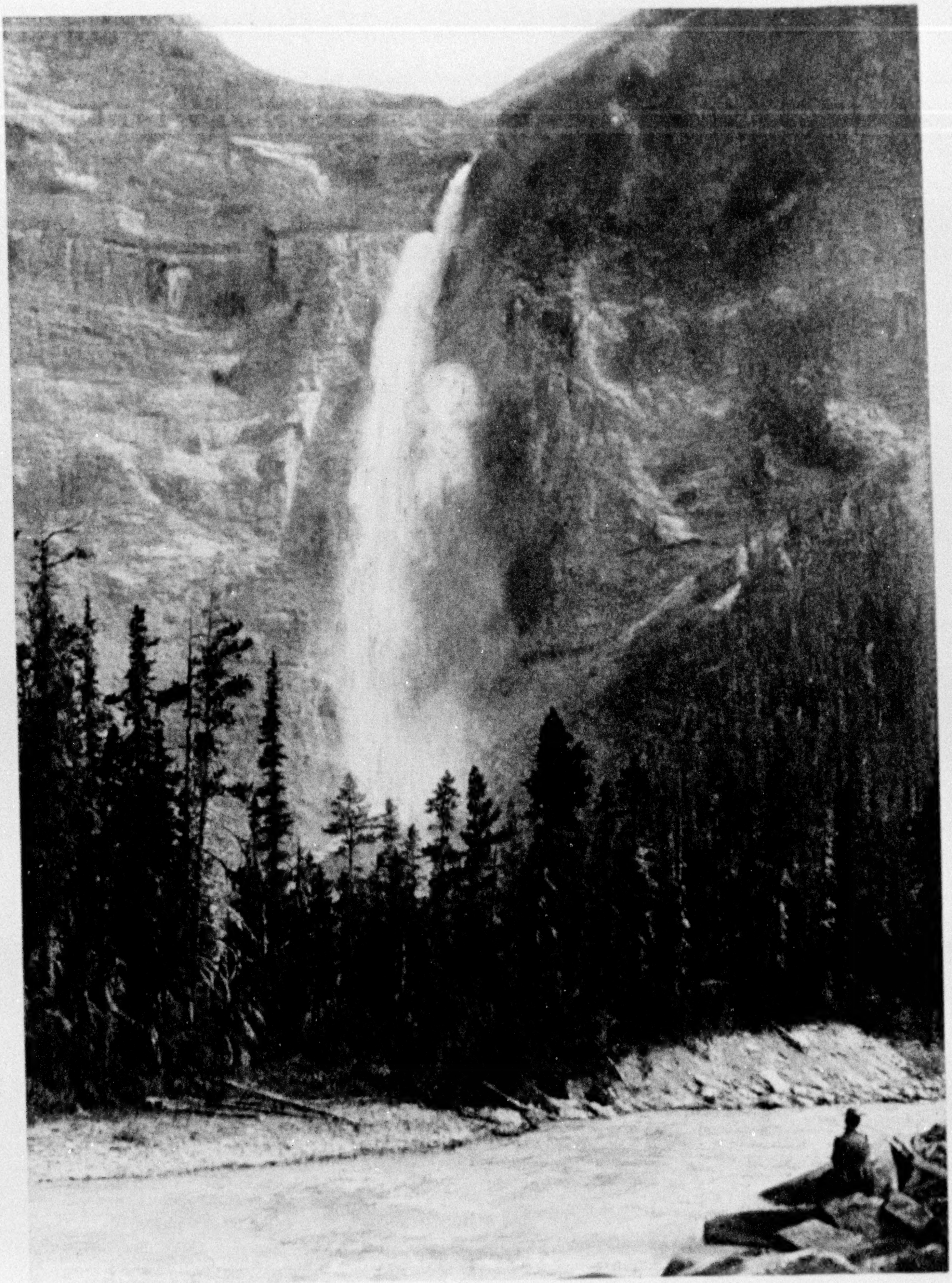
Paradise Valley is easily reached from Lake Louise over a good trail. Mount Temple towers above it on the right, while at the end of the valley Mount Hungabe lifts his majestic head to a height of 11,000 feet.

XUM

Photograph by George Vaux, Jr., and Mary Vaux Walcott

THE TWIN FALLS IN THE YOHO VALLEY, FIELD, BRITISH COLUMBIA

The Twin Falls are about 600 feet high, the stream feeding them draining the Upper Yoho Valley, which has several glaciers on the mountain slopes above it. The park-like valley, with its beautiful trees and carpets of flowers, and the high mountains and glaciers surrounding it, is a wonderful place for the camp of the alpinist.



Photograph by George Vaux, Jr., and Mary Vaux Walcott

THE TAKAKKAW FALLS, IN THE YOHO VALLEY, NEAR FIELD, BRITISH COLUMBIA

These falls are fed by the melting of the glacier above, which is one of the numerous glaciers flowing from the great Waupetek snow field. The entire descent is about 1200 feet.

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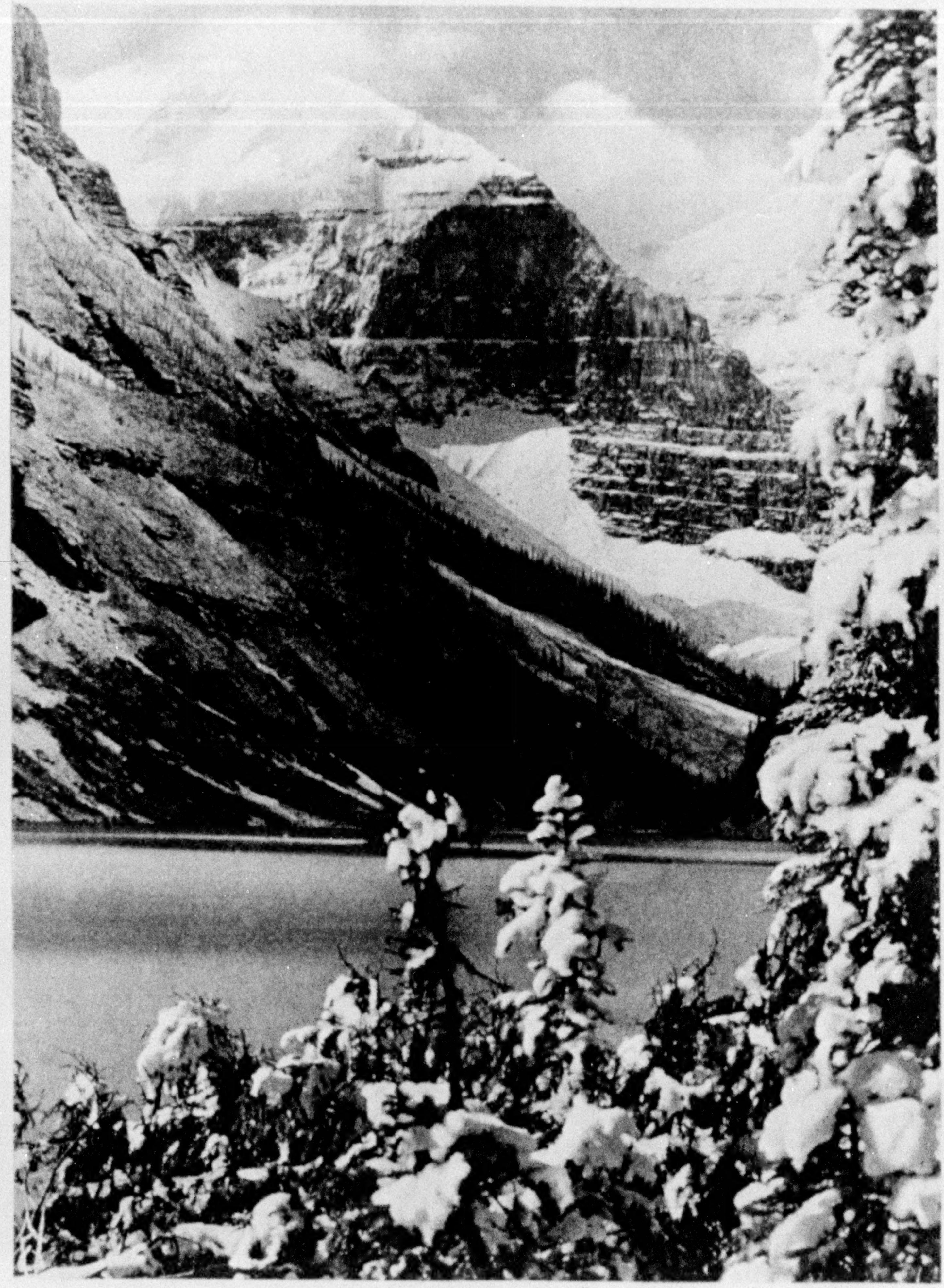


Photograph by George Vaux, Jr., and Mary Vaux Walcott

MOUNT LEFROY AND LAKE LOUISE

An early snowstorm in September enhances the fascinating beauty of Mount Lefroy and Lake Louise.

HAYLANDS, NORTH OF SMITHERS, BRITISH COLUMBIA, WITH HUDSON BAY MOUNTAIN IN THE BACKGROUND

Photograph by George Vaux, Jr.

ACROSS THE VALLEY OF THE KICKING HORSE RIVER, FIELD, BRITISH COLUMBIA

The mighty pyramids of the Van Horn Range in the background, their ruddy slopes streaked with snow.

Photograph by George Vaux, Jr.

RISING MISTS IN THE VALLEY OF THE KICKING HORSE RIVER, FIELD, BRITISH COLUMBIA

The shoulder of Mount Stephen on the right. Kicking Horse River was so named in 1858 by Sir James Hector, one of the foremost explorers of the Canadian Rockies, who, while journeying down the valley of the Beaverfoot River, arrived at its junction with a large and unknown river. Owing to a serious accident which occurred at this point and nearly cost him his life, due to a horse falling and kicking him, the newly discovered river was named "Kicking Horse" to commemorate the incident.

XUM

Photograph from J. C. Grew

THE PRIDE OF NEW ZEALAND

Due to its remarkable area of grazing lands and the introduction of English grasses, sheep raising is the great industry of New Zealand. Probably no other country on earth of equal size approximates New Zealand's record in sheep grazing, and its principal export is wool. As the flocks grow, however, the pelts change, and today there is much less merino and much more of the coarser and long-bred wool developed for market. The value of New Zealand's annual wool production is about thirty-five million dollars.

Photograph from Lieutenant W. K. Harris

A DAIRY HERD IN NEW SOUTH WALES

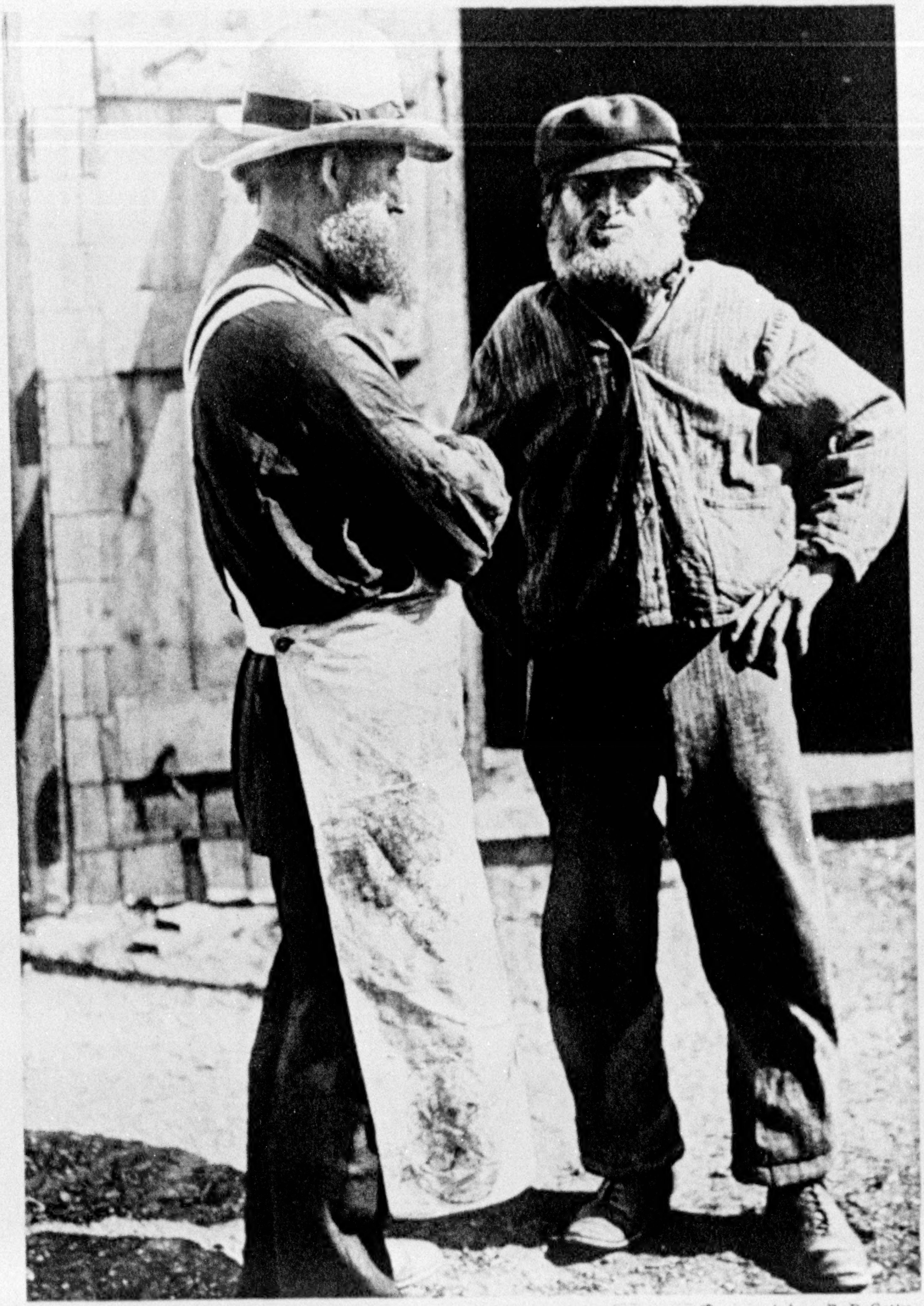
Dairying has made remarkable strides throughout New South Wales, and takes rank as one of its great industries.

XUM

Photograph by George F. Hammond

MOUNT ASSINIBOINE, THE AMERICAN MATTERHORN

Remarkable as one of the most beautiful of the Canadian peaks, Mount Assiniboine, first ascended in 1901 by James Outram, towers 11,860 feet into the clouds near the boundary between British Columbia and Alberta, about twenty miles south of Banff. Rising in a great pyramid to the sky, Assiniboine much resembles Switzerland's pride, the Matterhorn, although Mont Blanc is even more its prototype, and the similarity becomes at once apparent to the observer. This giant tooth of the Canadian Rockies was named for an Indian tribe of that region.



Photograph from R. P. Getty

VILLAGE GOSSIPS, CANADA

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Photograph by Mary Vaux Walcott

ILLECILLEWAET GLACIER, BRITISH COLUMBIA

The Illecillewaet Glacier is easily reached from Glacier, British Columbia, over a beautiful trail one and three-quarter miles from the railroad. The ice fall is very picturesque, and in this view the characteristic blue bands are shown, as well as the seracs, with their separating crevasses.

already said, is by appointment of the existing government for life, while in Australia it is by election for a term, is explained by the more democratic spirit in Australia, and also because of the citizenship of two races in Canada, while in Australia the people are homogeneous and all English.

In Canada there was doubt as to who would possess the greater voting power as the country grew, the English or the French. This situation was thought to require a conservative Senate, which would mitigate the power and possible injustice and prejudice of the popular majority of either race.

The fact, too, that the constituent States in the Australian Commonwealth had long exercised independent and separate power, and naturally leaned toward a retention of as much power in the separate States as was consistent with an effective Commonwealth, reproduced the situation which existed at the time of the framing of our Constitution.

On the other hand, in Canada, when the Dominion was formed, the dominant States or provinces of Quebec and Ontario had been united under a complete and all-inclusive government by a single legislature since 1841.

In the case of Australia, it should be noted that the making of the Commonwealth was not left only to delegates, as in the Quebec Conference, but was confirmed by referendum to the people of all the constituent States—a procedure indicating the greater insistence upon the rule of the people among the Australians.

THE CONFEDERATION OF SOUTH AFRICA

Some ten years after the formation of the Commonwealth of Australia the South African Union was formed. In creating this, the conditions calling for the union were quite different from those which had existed when the Dominion of Canada and the Commonwealth of Australia were established.

In South Africa the British domain included Cape Colony, the Orange Free State, the Colony of Natal, and the Colony of Transvaal, together with an extensive hinterland. The bitter and bloody conflict in the Transvaal War had naturally left a condition which required care in the making of the new government and presented different problems from those of Canada and Australia.

It was necessary to strengthen much the central government at the expense of the federating States. Indeed, the breadth of the powers of the central government in South Africa, as compared with those of the Dominion or Commonwealth, is so great that accuracy in calling the South African Union a federation at all may be questioned.

The central government has a general grant of power "to make laws for the peace, order, and good government of the Union." No other power is conferred, and this is because any subsequent enumeration of powers would have only weakened the grant.

The powers of the constituent provinces hardly exceed those that might be granted to a county council in England or to a general municipal corporation in this country. There is equal representation of the provinces in the Senate and a popular district representation in proportion to the electorate for the lower house.

The powers of the executive are much enlarged because of the presence within the jurisdiction of a large number of native races. The Union government today has under its control 5,000,000 natives within the territory of the States making up the Union, and outside of the States 2,000,000 more.

In spite, however, of these differences in favor of the power of the central government, the government is a popular one, and representative directly or indirectly of the people.

In all these associated British governments of which I have been speaking—in Canada, Australia, and South Africa—an independent judiciary like that of the mother country has been provided by appointment of the executive and a tenure for life. In this respect the new State-makers wisely followed the British and our Federal Constitution.

ALL THESE NEW ENGLANDS ORIGINATED WITH THE PEOPLE

The first fundamental fact that we note in the organization of these govern-

Photograph from Lieut. W. K. Harris

CABBAGE TREES ON THE SOUTH COAST OF NEW SOUTH WALES

The British first occupied Australian soil when, in 1788, Arthur Phillip, a captain in the Royal Navy, arrived in Botany Bay with eleven ships, bringing 750 convicts. These convicts had been sentenced to transportation from England, and were brought to Australia because the American Colonies, having just become independent, could no longer be utilized as a dumping ground. Finding the shores of Botany Bay unsuited to the requirements, Captain Phillip went further up the coast and established his settlement where Sydney now stands. This system of transportation continued until 1868, when the last Australian State refused longer to allow it. The convicts, men and women, were used as laborers by the freeholders.

Photograph from Lieut. W. K. Harris

FAIRY DELL FALLS, IN THE BLUE MOUNTAINS OF NEW SOUTH WALES

We are accustomed to associate glaciers and perpetual snows with mountain ranges, but in all the mountains of Australia there is no such thing as a peak capped with perpetual snow, and there is not one single glacier in all the land.

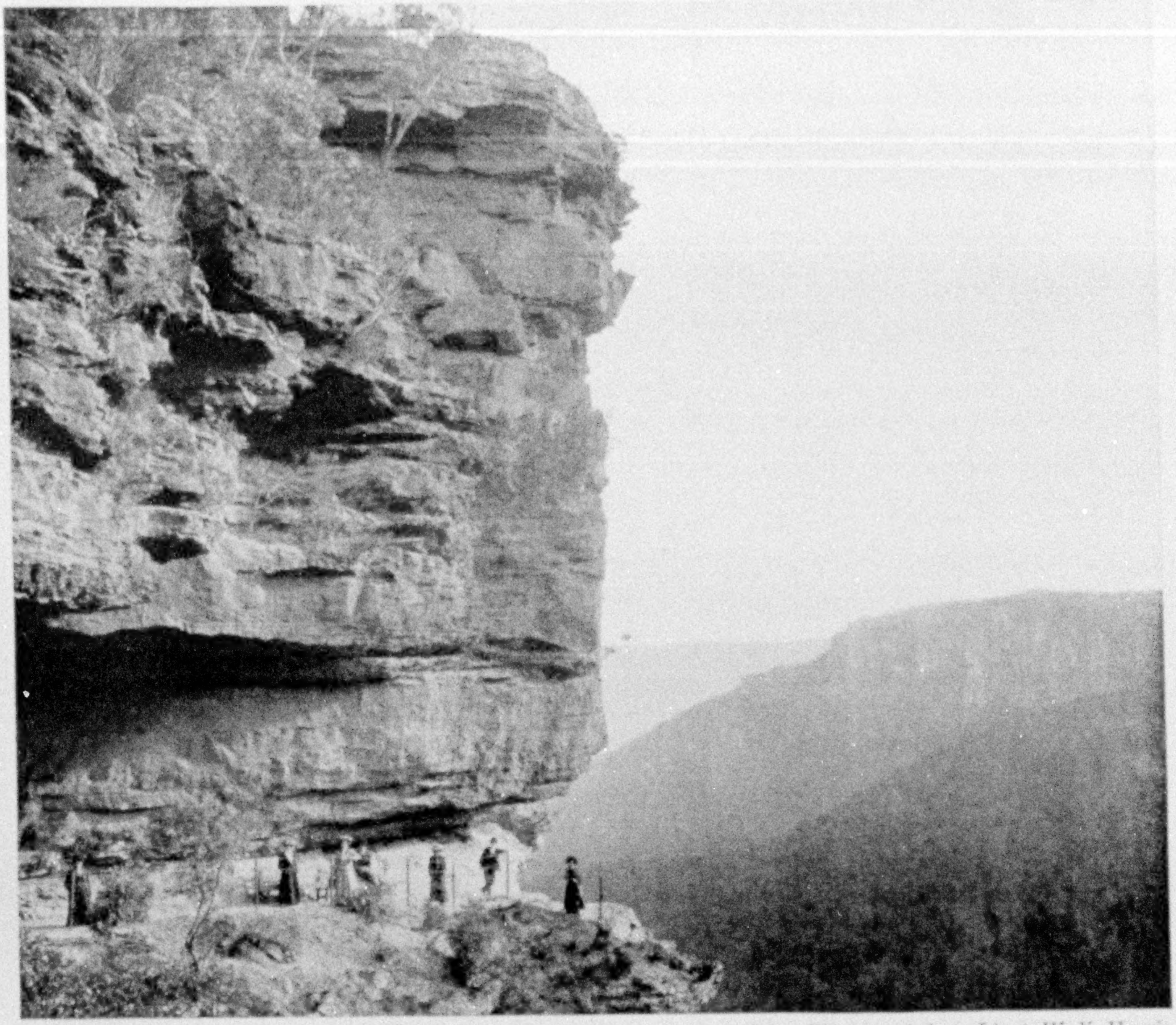
ments is that their formation originated with the people, and that they are popular governments; that while the framework of each was the subject of discussion with the home ministry in Great Britain, Parliament did not pass the acts which gave them legal life until they had the full consent of the people of each of these nations—for nations they are.

No pressure was brought by the mother country to amend in any substantial way the constitutions suggested. A practically complete autonomy has been recognized and encouraged by the home government in all these New Englands.

The union of the separate States into these federations has reduced the powers of interference or control of the home government which it had with the separate States which were being federated. Indeed, those powers have been minimized quite beyond the recommendations of the Earl of Durham.

The foreign trade of these New Englands is for their independent judgment. Protective tariffs are permitted even against England, and separate reciprocity agreements with other countries have been put in force. While the mother country must in the nature of things retain some control over their foreign relations, the practice has been in all diplomatic negotiations which concern them to allow them a representative in the negotiations. This was the case in the Joint High Commission to consider the differences between England and the United States growing out of the Civil War, in 1871, when Sir John MacDonald was one of England's representatives, and the practice has continued ever since.

There have been times in the history of Canada when there was a decided bent on the part of some elements in the population toward annexation to the United States or independence. With the ex-



Photograph from Lieut. W. K. Harris

CLIFFS OVERHANGING NATIONAL PASS, IN THE BLUE MOUNTAINS, NEW SOUTH WALES

Geologists tell us that the continent of Australia is one of the oldest existing land surfaces, having been good dry land when much of what is now Europe and Asia was still under water. Its mountains are low, mere worn-off stumps, it would seem, for the greatest peaks are only about 7,000 feet high. In the interior the scenery becomes rather monotonous because of its flatness, but in the mountainous country, which follows the general direction of the coast-line, wonderful views, full of color and variety, are to be had upon every hand.

ception of a small but vociferous faction in Quebec, this feeling has entirely disappeared.

In South Africa there had been, as a condition, the Transvaal War and the objection of the Dutch colonists to English control. That was solved by the war and by the statesmanlike dealing with the question under Lord Milner and others since that time; so that now, in a marvelously short period, and because of the generous and just dealings of England with the dissentient Dutch element, a desire to separate from England has been confined to a comparatively few, if we can judge by the insignificance of the rebellion headed by De Wet since the war began.

GREAT BRITAIN IS NOW REAPING HER REWARD

England has levied no taxes, has required from these dependencies, if they may be called such, no contribution to the heavy cost of the imperial defenses of herself and her New Englands and her other dominions. Whatever has been done in the way of the construction of a navy by Australia and whatever has been proposed to be done by Canada in this regard have been entirely voluntary.

Photograph from Government Publicity Department, Sydney

MARTIN PLACE, IN SYDNEY, NEW SOUTH WALES

This Sydney street reminds one of Michigan avenue, Chicago, and the resemblance is carried still further by a similarity in the personality of the two cities. The same enterprising atmosphere prevails in this Australian metropolis as exists in our own city at the foot of Lake Michigan. Sydney, the capital of New South Wales, and Melbourne, the capital of Victoria, vie with each other for commercial supremacy, and in each of them live nearly one-half of the people of its State—a fact that is deplored by Australian economists, who believe that there should be less congregating in cities and more settling upon the land.

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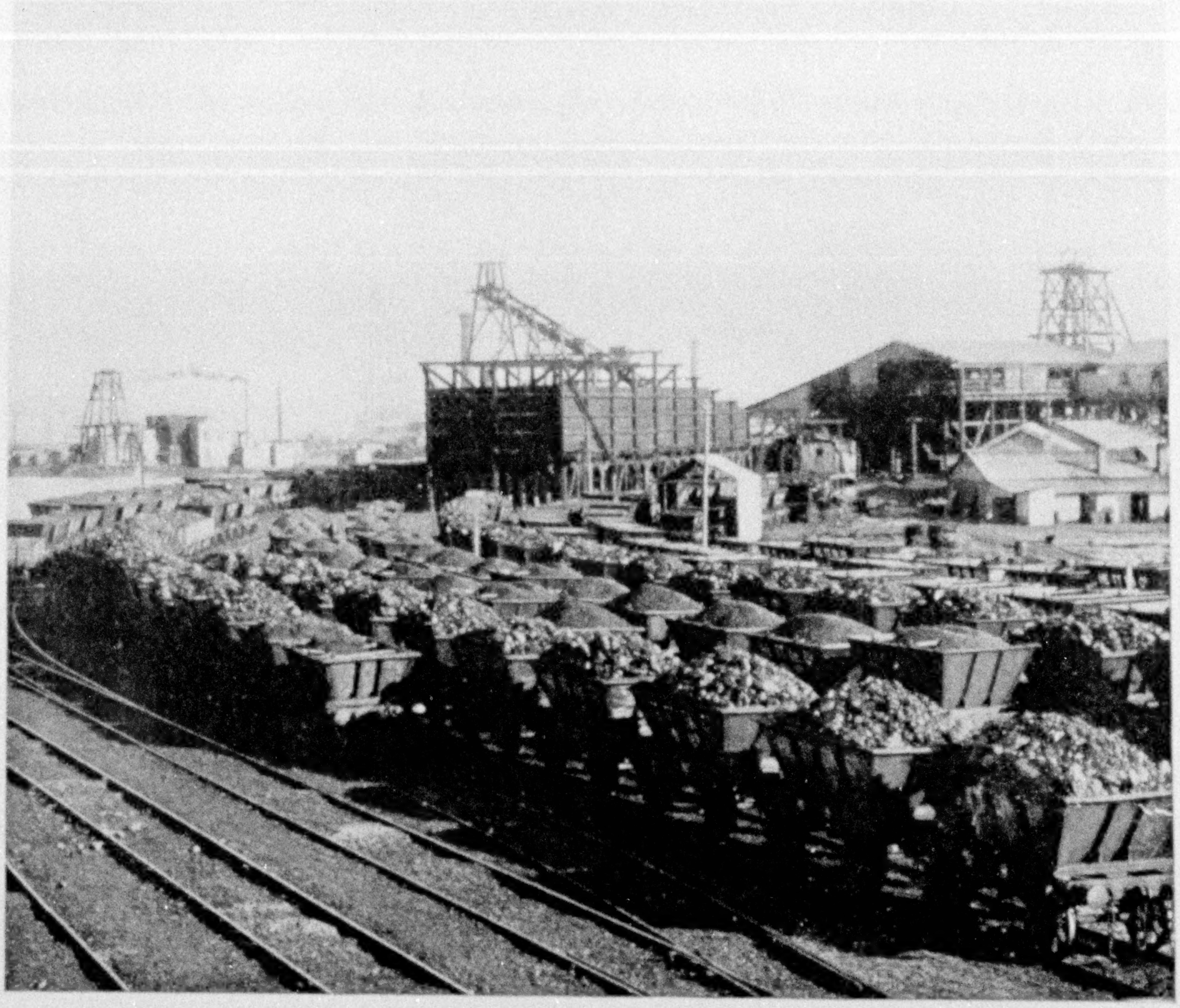

A COLLIERY IN NEW SOUTH WALES

Australia is rich in natural resources, and not least among them is coal. This product forms one of the most valued yields of New South Wales, the total area of carboniferous strata in this State being estimated at about 24,000 square miles. Much of the coal is shipped from the city of Newcastle, an important commercial center, on Port Hunter, about a hundred miles by rail north of Sydney. This city has excellent wharfage facilities and the docks extend along the shore for nearly three miles. Its total tonnage of exports in a given time frequently exceeds even that of Sydney itself.

The truth is that it is hard to imagine a relationship between a mother country and peoples who recognize allegiance to that mother country under which the mother country could exercise less real control than under the three governments which I have thus inadequately described.

Of course, in each the King has been represented by his Governor General, and in each there is some power, but rarely used, to veto legislation on imperial grounds. There is, as already said, an appeal to the Privy Council—absolute in the case of Canada and the South African Union, but qualified in the Australian Commonwealth.

Chastened by her experiences in the war of the American Revolution, learning in her dealings with her people and their government in the furthermost parts of the earth how to promote their happiness and thus to treasure their love, Great Britain is now reaping her reward.

Canada has sent abroad 125,000 troops to reinforce the British army and has 125,000 more ready to go. The proposal now is to increase this number—and it will probably be carried out—to 500,000 men, or one-sixteenth of the entire population of Canada. Canada is spending over $1,000,000 a day in support of this military policy.

She has existing heavy obligations incurred in the construction of railways by

Photograph from J. C. Grew

A ROADWAY CUT OUT OF SOLID ROCK IN BULLER GORGE, NEW ZEALAND

New Zealand has glaciers, waterfalls, and volcanic peaks without number. Mineral springs and pools of water of every temperature, from ice-cold to boiling-hot, together with geysers and mud volcanoes, abound, and these, beside providing unusual scenery, furnish the location for many health resorts.

Photograph from New Zealand Government Tourist Department

THE REMARKABLES: LAKE WAKATIPU, NEW ZEALAND

South Island, New Zealand, is the Switzerland of the South Seas, for in its interior tremendous mountain ranges pile one upon the other until the lofty peaks thrust their snowy crests through the very clouds. Lakes there are in profusion, very deep and of vivid hue. The rivers are mountain torrents and on the island's southwest side there are more than a dozen deep fiords which bring the sea almost into the heart of this rugged country. This island is less than 200 miles wide at its broadest place, and Mount Cook, a little over 12,000 feet, is its highest point.

Photograph from New Zealand Government Tourist Department

ANOTHER VIEW OF LAKE WAKATIPU AND THE REMARKABLES: QUEENSTOWN, NEW ZEALAND

Country life in New Zealand is described as delightful. The solitude of early colonial days has now practically ceased to be continuous except in the few scattered outposts, and the country is becoming filled with capable, independent farmers. Where in other days attention was only given to securing the very necessities of existence, much is now being done to beautify the homesteads, and, even though the farmer's house may be only a cottage, it is now likely to be vine-covered, with a garden and orchard to be proud of.

Photograph from Government Publicity Department, Sydney

ON THE ROAD TO TWEED HEADS: NORTH COAST, NEW SOUTH WALES

The climate of the southern part of Australia is for the most part ideal, the thermometer varying not much more than 20 degrees throughout the year. In summer there is an average temperature in New South Wales of about 72 degrees and in the winter months about 52 degrees. Its rich soil is well watered and, assisted by the even temperature, the valleys and lowlands are covered with a luxuriant herbage.

Photograph from Lieut. W. K. Harris

THE WONDERFUL HAWKESBURY BRIDGE: NEW SOUTH WALES

The Hawkesbury Bridge is one of the largest and finest examples of engineering skill in the southern hemisphere and embodies all the latest improvements in bridge designs. The most difficult part of the work in connection with the construction of the bridge was the great depth to which it was necessary to sink the piers to secure a good foundation. The body of each pier is 48 by 20 feet, with rounded ends, enlarged at the base to 52 by 24 feet, and some of the piers are sunk to a depth of no less than 162 feet below high-water mark, which is said to be the deepest bridge foundation in the world. The abutments are built of local freestone and are very fine examples of stonework. The piers from 3 feet below water are built of masonry. The superstructure of the bridge is built for a double line, and the main girders or trusses are 410 feet long between centers of end pins and 58 feet effective depth at center. The bridge is built of steel throughout, and its total length between abutments is 2,896 feet.

pledging her credit to aid them. In the Intercolonial, in the Canadian Pacific, in the Grand Trunk Pacific, and in the Canadian Northern, obligations have been assumed that might well frighten a country with 8,000,000 of people. But now, in spite of these great burdens, which conservative financiers have looked upon with great concern, she proposes to take over a new huge debt before the conclusion of this war.

Only a young people with great national spirit, with a great territorial empire and magnificent resources, prompted by the deepest loyalty to the principles of civil liberty and popular government like that of Great Britain, could boldly and calmly face a future so full of difficult problems and unparalleled financial obstacles.

Speaking of the history of Canada down to 1912, since the British North America Act, in 1867, Professor Wrong, professor of history in the University of Toronto, said:

"The history of Canada during this momentous period is not a tale of courts and camps, of the workings of diplomacy to avert or to lead to war, of the struggles between those who cherish what is

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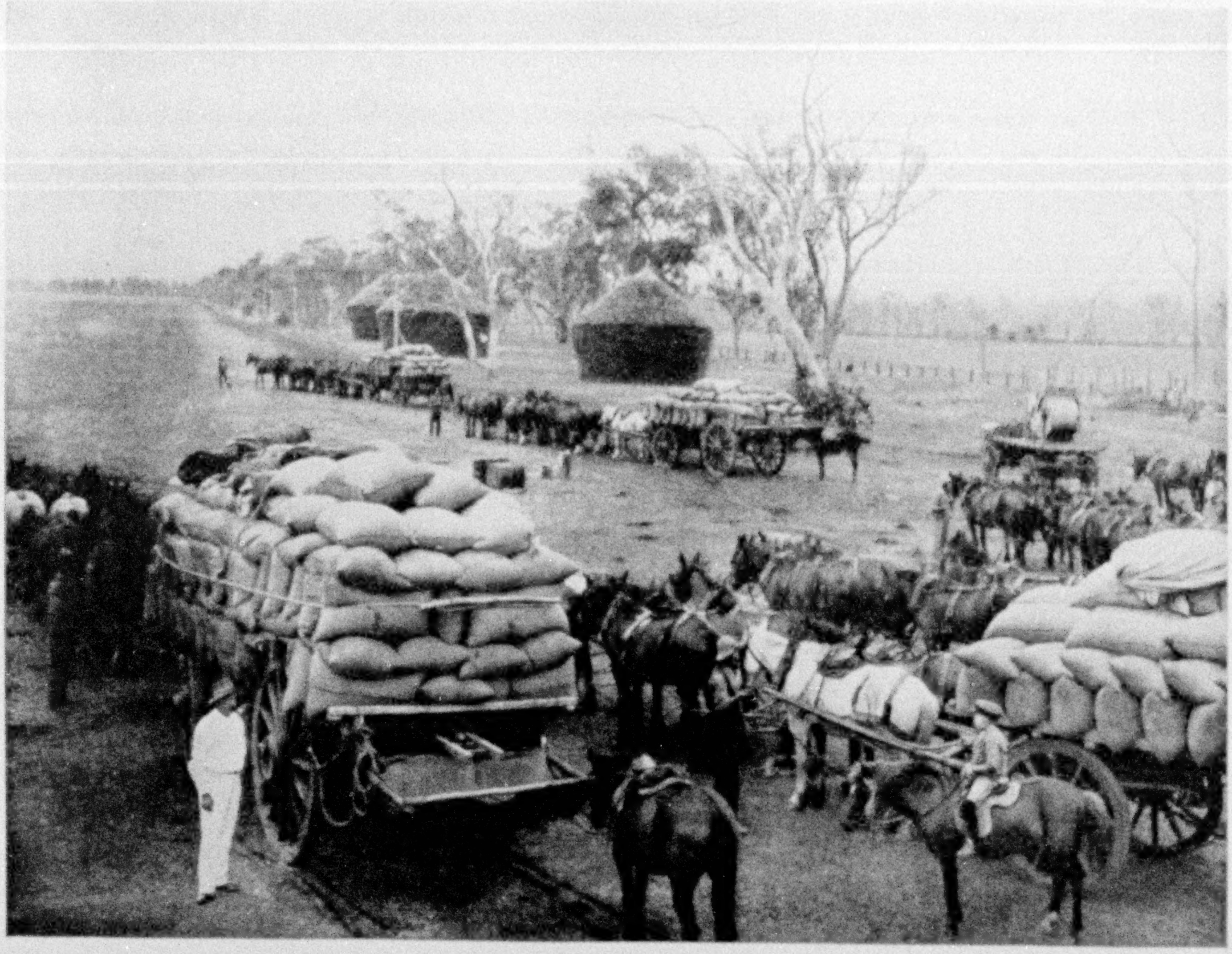


Photograph from Government Publicity Department, Sydney

WHEAT TEAMS LEAVING A FARM IN THE WESTERN DISTRICT: NEW SOUTH WALES

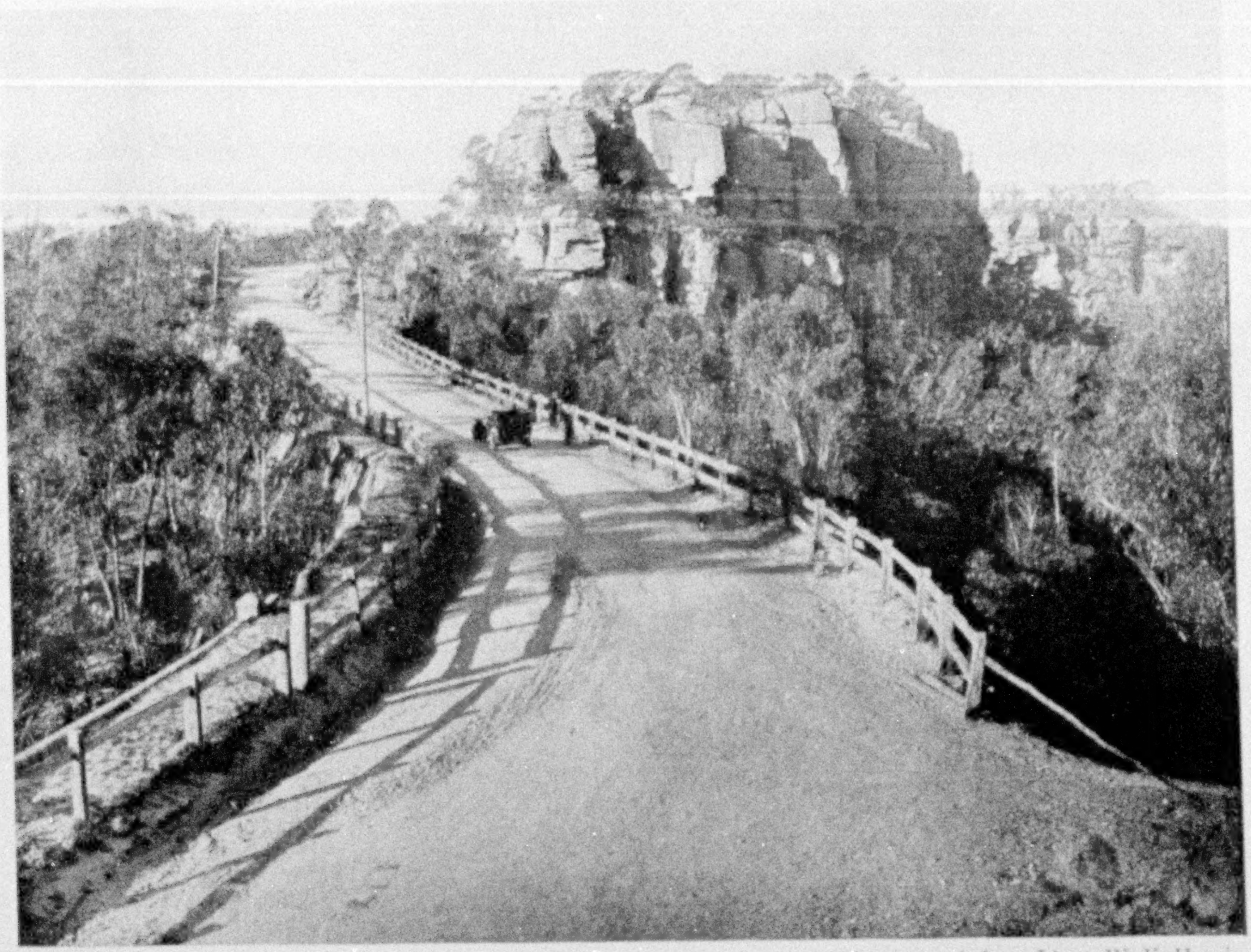
They do most things in Australia on a large scale, and, next to sheep raising, agriculture is the principal industry. At present there are possibly 10,000,000 acres of land under cultivation, and approximately two-thirds of it is devoted to the production of breadstuffs. The enormous wagons, on which are piled nearly a hundred great bags of grain, are drawn by teams of ten or twelve horses from the farms to the railroad, sometimes many miles away.

old and what they think is good advantage and those who dream of a new and better order. The pomp of a stately and well-ordered society, movements in art and literature, the menaces and friendships of other nations, have but little place in the narrative. The story is one of internal organization, or trade policy, of the occupation of land hitherto almost unpeopled, of the opening up of communication and the building of railways and canals, of the working of political institutions, of the disputes of the central government in its relations with the provincial powers. In one sense it is not a dramatic tale; it has little of the ceremonial of Old World movements. But, none the less, it is a profoundly romantic story of the birth of a nation and of its passing from neglected obscurity into a conspicuous place."

THE BAPTISM OF FIRE

Today Canada is passing through her baptism of fire. While there are many differences in the history of Canada and that of the United States, there are many resemblances—due, if nothing else, to the common origin of their peoples and to the material problems of settling and developing half a continent.

In our Civil War our peoples divided on an issue that developed the moral strength of the two great contending sections. Both showed themselves willing to make the ultimate sacrifice of their own lives and the lives of those dear to them and of all their material possessions. In that Civil War the people of the United States found themselves and proved to themselves and to the world their moral fiber and their greatness as a people.



Photograph from Lieut. W. K. Harris

MOUNT VICTORIA PASS: BLUE MOUNTAINS, NEW SOUTH WALES

Most Australians thoroughly appreciate their good roads, for the time is not long since when over the same route which an automobile now traverses in one short afternoon their fathers spent six weeks in hacking a way through the dense bush for their creaking bullock carts to negotiate.

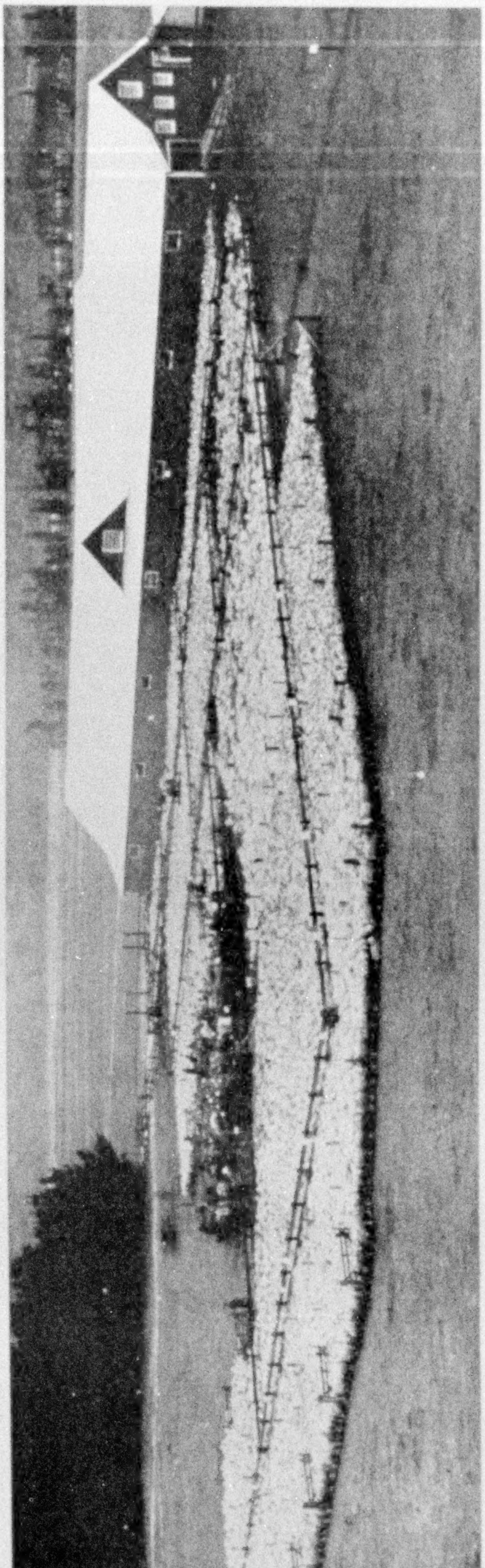
Canada is now going through a similar experience. Every family with young men of military age in the Dominion has offered, is offering, or expects to offer them up as possible sacrifices upon the altar of their allegiance to the mother country.

What is going on in Canada is also happening among Great Britain's children in Australia and South Africa. As among the French in Canada, so among the Dutch in South Africa, England's justice retains for her a loyalty that a less equitable policy would have lost.

I have not at hand the number of troops furnished by Australia and South Africa to swell the British forces, but the graves of those New England sons in the battlefields of the Gallipoli Peninsula and elsewhere bear silent but eloquent testimony to the tie that binds them to old England.

Canada is from 2,000 to 5,000 miles from the British Isles. Australia and Africa are half around the world. Their people live under different conditions. They have a different government. They must perforce, because of distance, have different views of life. The remoteness of distance and condition has much to do with destroying interest and affection and loyalty.

When it does not do so, when the patriotic thrill courses through the veins and arteries of men in Ontario, Winnipeg, Saskatchewan and British Columbia, in Australia and at the Cape of Good Hope, as hotly as in men between Lands End and John O'Groats, we would find a cause; and we do find it in the wisdom of England in dealing so generously with her trans-Atlantic, Pacific, and African daughters, and in strengthening their loyal affection by granting independence of government and assurance of protection as members of her family.



Photograph from Paul Thompson

A MODERN NEW ZEALAND SHEEP STATION

In the old days sheep raising in this Pacific archipelago meant merely turning flocks upon the public domain and letting them feed upon whatever they could find, with no other object than producing wool. Nowadays these flocks are more carefully tended and there is much attention given to their feeding. Of late years many acres of turnips and succulent English grasses have been sown to give better quality to the mutton, and the whole grazing industry has been placed upon a much more scientific and systematic basis.

ALL ARE ASSOCIATES IN A GRAND FEDERATION

The term "Empire of Great Britain" is, as applied to these governments, a misnomer. There is no imperial control in the Parliament or in the King over these peoples. They are associates of the mother country in a federation in which they enjoy complete autonomy, and the mother takes the great part of the burden of imperial defense.

Gratitude for the burden she has carried for them, a realization of the benefits their association with her as part of the so-called British Empire secures them, and the love of the liberty regulated by law, secured under the British Constitution, which is the essence of their political lives and doctrine, are the reasons for this present wonderful manifestation of loyalty.

The ultimate fact that reflects the highest credit upon the statesmanship and foresight of England is that as she has lightened her formal hold upon these New Englands, and ended their real subordination, she has strengthened their spirit of allegiance to her.

It is an eloquent tribute to the living force of a bond formed of a common inheritance of civil liberty and the principle of the rule of the people strengthened by just and generous dealings of the mother with the daughters.

The supreme test has come in the present war. It has shown that there is something besides the prospect of material benefit or of material burdens and sacrifice which controls the action of peoples.

Well may England say, as these brave, courageous legions from the Transatlantic and from the Antipodes rally to her support: "I cast my bread upon the waters, and after many days it has returned unto me."

MANY CANADIAN WOMEN HAVE VOLUNTEERED AS NURSES FOR THE EUROPEAN WAR

This picture shows H. R. H. the Duke of Connaught inspecting those who went with the University of McGill Hospital Corps

Photographs by Chesterfield & McLaren

RECRUITING IN CANADA

Two men are here seen enlisting in one of the battalions of the Canadian expeditionary forces for service in Europe

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CANADIAN RECRUITING OFFICERS AT WORK ON A CITY SQUARE, SEEKING VOLUNTEERS FOR OVERSEA FORCES

Photographs by Chesterfield & McLaren

SEEN EVERY WEEK THROUGHOUT THE DOMINION OF CANADA: TROOPS LEAVING INLAND POINTS TO EMBARK FOR THE EUROPEAN WAR

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H. R. H. THE DUKE OF CONNAUGHT INSPECTING THE 42D BATTALION OF HIGHLANDERS AS THEY MARCHED OFF TO THE SHIP THAT CARRIED THEM TO EUROPE

A sight to be seen at regular intervals in Canada

Photographs by Chesterfield & McLaren

QUAINTNESS IN RELIGION OF QUEBEC PROVINCE

A view which gives some idea of the huge numbers that will gather at an open-air mass

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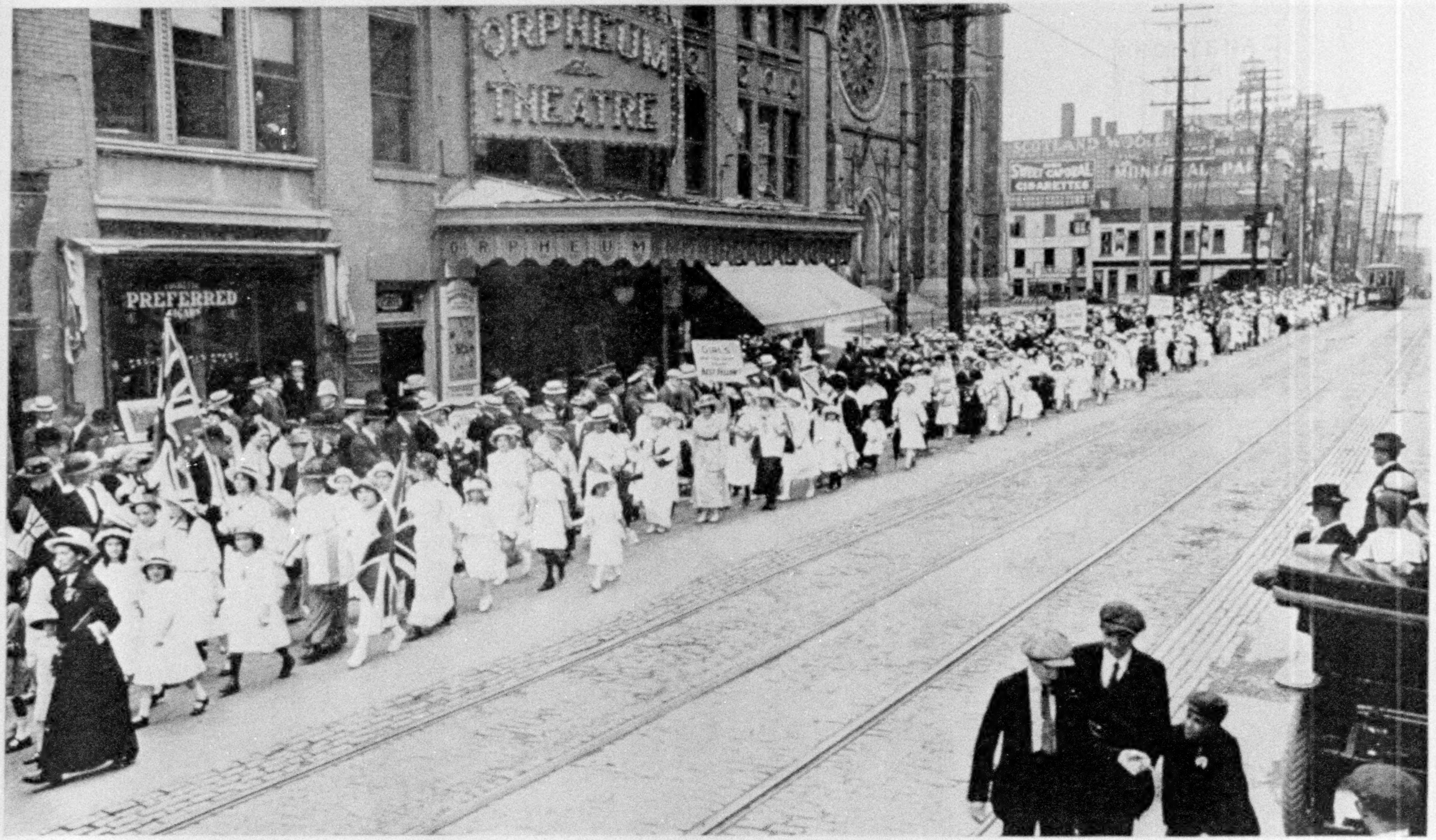


Photograph by Chesterfield & McLaren

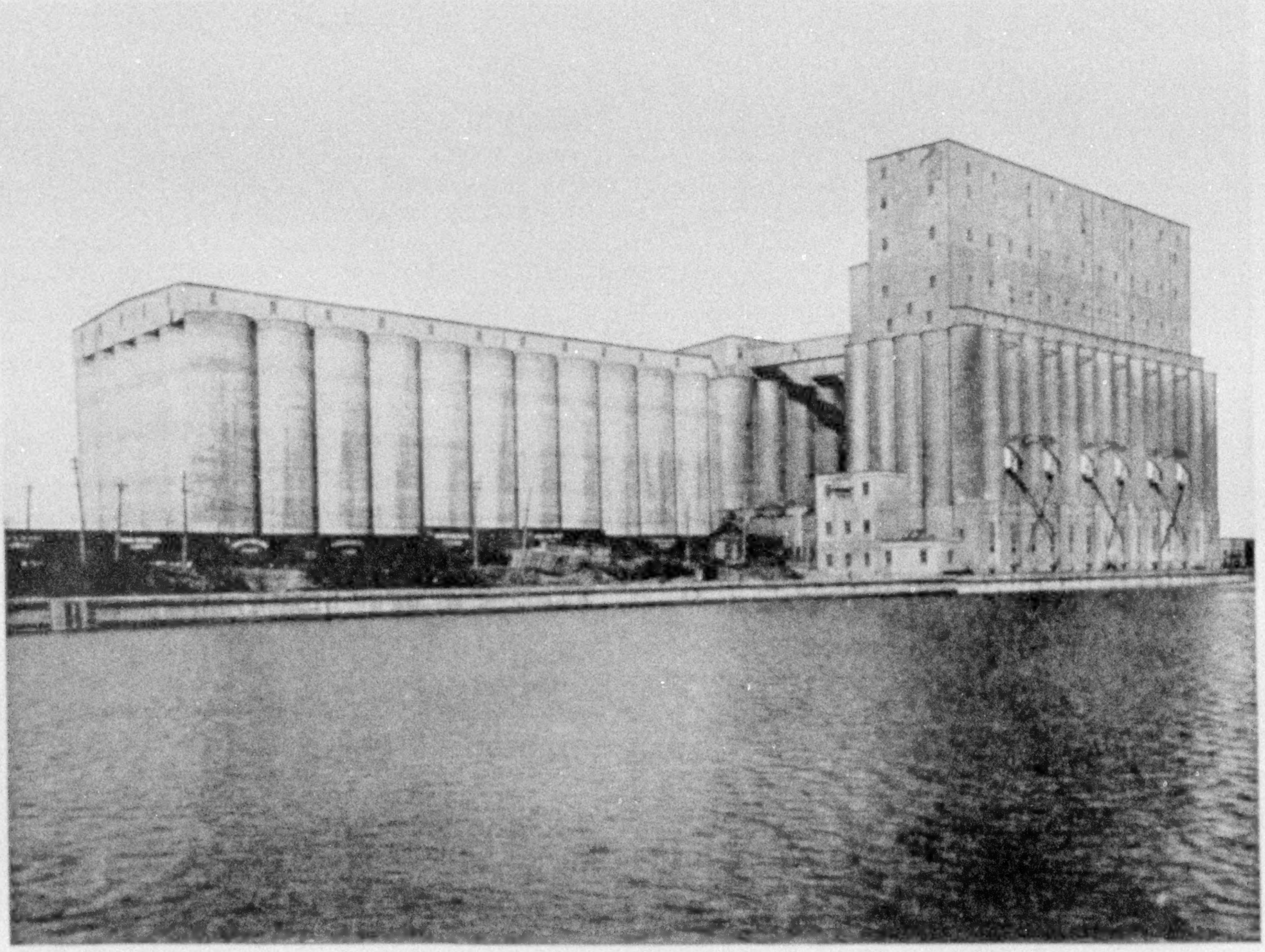
A RECRUITING PARADE OF WOMEN AND CHILDREN WHOSE HUSBANDS AND FATHERS HAVE GONE TO THE FRONT, WITH THE OBJECT OF STIRRING UP MILITARY ENTHUSIASM

Photograph by Chesterfield & McLaren

THE OLD AND THE NEW AT THE ANCIENT CAPITAL

Troops in training for the present great war are here seen passing through the St. Louis Gate of the fortifications of Quebec City, which were built by British regulars after the conquest of 1759

FREIGHT STEAMSHIPS LOADING IN MONTREAL HARBOR



Photographs by Chesterfield & McLaren

FORT WILLIAM, ONTARIO, HAS THE LARGEST GRAIN ELEVATOR IN THE WORLD

Built by the Grand Trunk Pacific, Canada's newest transcontinental line, to facilitate transfer of western grain from rail to inland boat. Its capacity is 7,500,000 bushels, and it was planned so that its storage space can be trebled as the grain trade expands.

QUEBEC PROVINCE: A CHURCH CEREMONY AT ST. PATRICK'S, THE LEADING IRISH CATHOLIC CHURCH OF MONTREAL

Prominent business men act a guard of honor in the procession through the grounds of the church

Photographs by Chesterfield & McLaren

WINTER FESTIVITIES IN CANADA

Street parade of snowshoe clubs on the occasion of a snowshoers' convention

XUM

Photograph by Chesterfield & McLaren

CANADA'S RUINED HOUSES OF PARLIAMENT

The Federal Parliament building at Ottawa was completely gutted by fire on March 1. It was said to have been the finest specimen of Gothic architecture in America, and is to be reconstructed as per original plans.

Photograph by Chesterfield & McLaren

WAR CANOE RACING, THE POPULAR AQUATIC SPORT

Every waterside town in Canada has its canoe club, and all members look forward to the annual races, which terminate in the Canadian Canoe Championship races at the end of the season. This picture shows the finish of one of the big races.

Photograph by Chesterfield & McLaren

"BOUNCING" IN CANADA

Winter climate is made the most of and all Canadians take an interest in outdoor sports. The picture shows a crowd of merry snowshoers "bouncing" one of their comrades when meeting him in the streets.

THE WORLD'S STRANGEST CAPITAL

By John Claude White

Author of "Castles in the Air," in the National Geographic Magazine, April, 1914

LHASA, the Place of the Gods, well deserves its name, as anything more beautiful can hardly be imagined than the vision of the sacred city set against its magnificent background of snow-capped mountains. Whether seen on a brilliant day, under a cloudless sky, during a thunder-storm, painted in soft, glowing tints by one of the wonderful sunsets seen only in Tibet, or by moonlight, when with outlines softened and toned down, the Potala stands out like a phantom castle in ghostly splendor from among the shadows of its surrounding trees, all aspects are equally lovely.

My readers are referred to the panorama of Lhasa, published as a supplement to this number of the Geographic Magazine.

The Potala is by far the finest building and eclipses all others in the beauty of its appearance. The present Potala was commenced in 1645 by the Grand Lama Nag-wang Lob-sang-gya-tsho, on the same site as a former building erected by Srong-tsan-gam-po, the king who founded the Jo-kang in the sixth century; and there is no doubt, I think, that the city is an ancient one and was in existence more than 1,200 years ago, although we can find no records giving any authentic historical account.

A DOMINATING STRUCTURE

The Potala dominates everything in Lhasa. The enormous mass of buildings, partly monastery, partly palace, and partly fortress, is built on a rocky ridge which stands out in the center of the valley, commanding the town and dominating the whole situation. Its architecture is magnificently grand, bold in outline and design; it towers above everything, with its gray white walls and buttresses, its immense flights of steps and terraces dotted with red-robed monks ascending and descending from religious ceremonies; its dull madder-red temple walls, with carved and painted windows, showing behind black brown yak's hair hangings, surmounted by its gilded roofs and set in almost park-like surroundings of trees and meadows, with snow-capped mountains on all sides and the Kyi-chhu, the River of Delight, running clear in many channels through groves of willow or poplar.

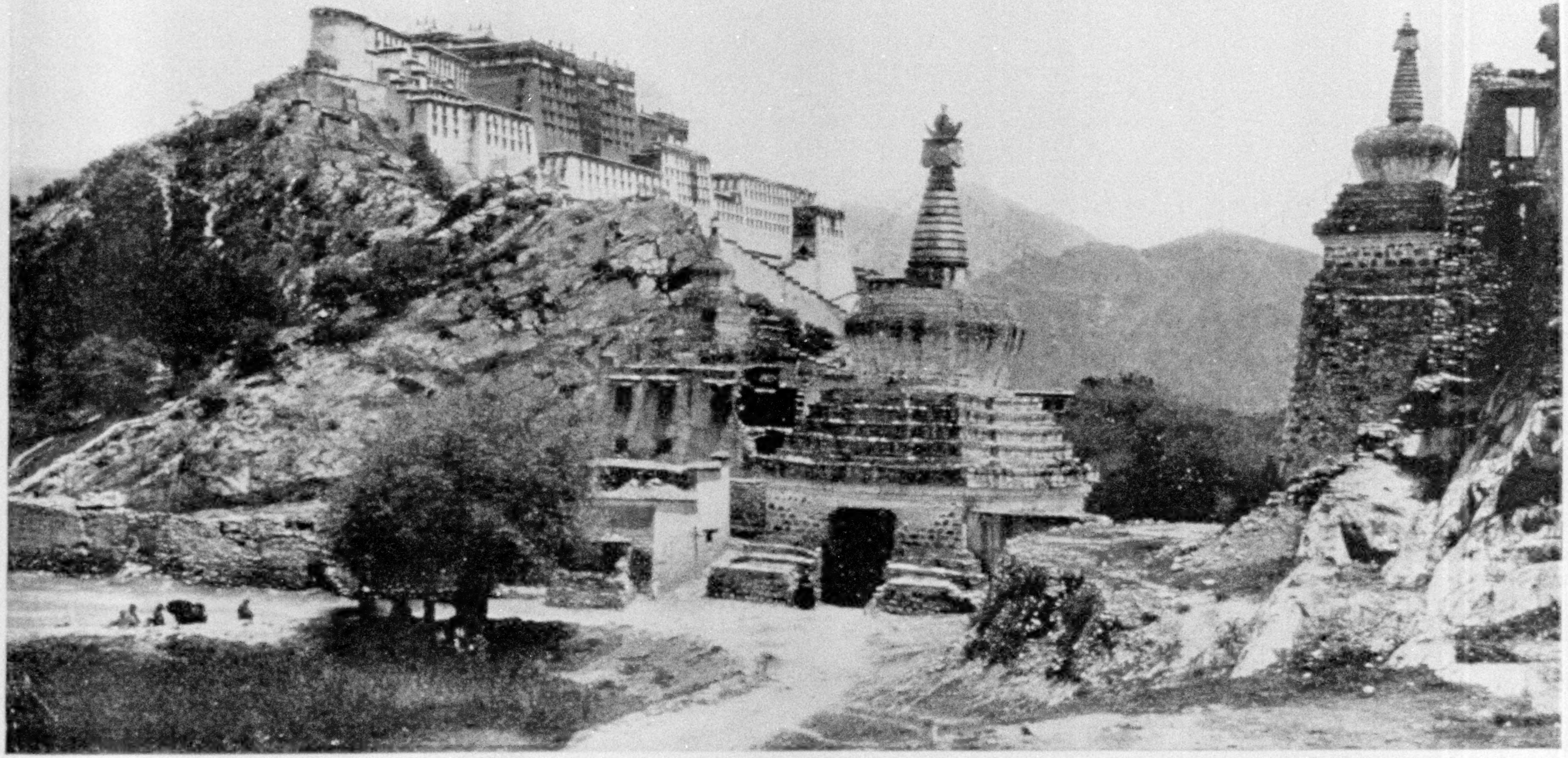
It is indeed a fitting shrine for the heart of any religion, and with such surroundings it is difficult to understand how the present form of Buddhism (Lamaism), as practiced in Tibet, could ever have sunk to the depths of degradation it has reached. It is devoutly to be hoped that some reformer may arise to cleanse it of its many superstitions and to reinstate the simple tenets of its founder.

A DISAPPOINTING INTERIOR

But the interior of the Potala is curiously disappointing, as it consists principally of a mass of dark passages and cells, a certain number of halls and flights of steps.

Among the larger halls were several striking ones, especially that in which was the gilt tomb of Nag-wang-Lob-sang Gya-tsho; the dome of this hall extended upward through several stories. On the tomb there was a great deal of metal ornamentation and the whole formed a fine piece of work. On each side of the principal tomb were similar ones of smaller dimensions, those of Dalai Lamas less notable.

In another room of fairly large dimensions the walls were lined with shelves from floor to ceiling, each shelf closely packed to its uttermost extent with images of Buddha. There must have been thousands of all metals—gold, silver, copper, brass—and many were of very beautiful workmanship. In another chapel there were hundreds of golden butter lamps.



Photograph by John Claude White

THE GATEWAY TO LHASA

The entrance or doorway into Lhasa passes through the *chorten*, or shrine, in the center of the picture, which is locally known as the Pargo Kaling. Remark the strings of bells hung on either side of the *chorten*. The darker portions of the Potala are the temple buildings and are colored madder-red, with the golden roofs appearing above.

It would be quite impossible to give even a semblance of a plan of this conglomeration of buildings, and it would take weeks, perhaps months, to visit every part of the enormous structure, capable of holding thousands of people. The Treasure House was said to be full of gold and jewels at the time of our stay; but we had no opportunity of inspecting it, nor did we see the Dalai Lama's private apartments, in the northeast corner of the building, as we were particularly asked by the Tibetans not to enter this part of the building and of course did not do so.

IMPOSING LANDSCAPES

From the flat roofs of the Potala the whole valley lies mapped out below—the town to the east, a mass of low, two-storied, substantially built houses interspersed with temples; the Jo-Khang, the most holy shrine in Tibet; the Chagpo-ri, or school of medicine; the Turquoise Bridge (Yutok Sampa), so called on account of its green-blue tiled roof; the many channels of the River of Delight (the Kyi-chhu), beyond which lies the Arsenal, and to the north the Monastery of Sera under the hills, containing 5,000 monks (see page 281). Further on the Debung Monastery, with 10,700 inmates; the gilded roofs of the Na-chung-chos-kyong (see page 286); and the Ling-Kor, the Sacred Road (see page 288), along which all devout Buddhists prostrate themselves in the hope that all their earthly sins may be forgiven, could be seen in places.

PICTURESQUE PRIESTS

There are monks everywhere in or near Lhasa. The three large monasteries of Sera, Debung, and Gah-dan alone contain about 20,000, and with all the other temples and monasteries the number cannot fall far short of 30,000, while the lay population of Lhasa only amounts to about 15,000, of whom 9,000 are women, who, strange to say, carry on practically the whole of the trade done. The remaining 6,000 males are about 3,000 Tibetans and 3,000 foreigners—Chinese, Nepalese, Kashmeris, etc.

The monks are very picturesque in their somber red robes, perhaps not quite so much in evidence in the town itself, as there there is more bustle and life and people are more occupied with trade than with the saving of their souls. The streets are full of laden animals, bringing in the every-day supplies, and caravans arriving from Mongolia and eastern Tibet. The people look well and cheerful and the town is not nearly so dirty as might be expected.

Of the other buildings in Lhasa, the School of Medicine, situated on a smaller hill on the same ridge as the Potala, stands out prominently. There is very little of interest connected with it, and the inmates or students hardly knew even the names of common useful herbs.

One of the prettiest spots in all the valleys was the Lu-Kang Garden, where there is a beautiful pool of water surrounded by lofty trees and willows half concealing an island in the center.

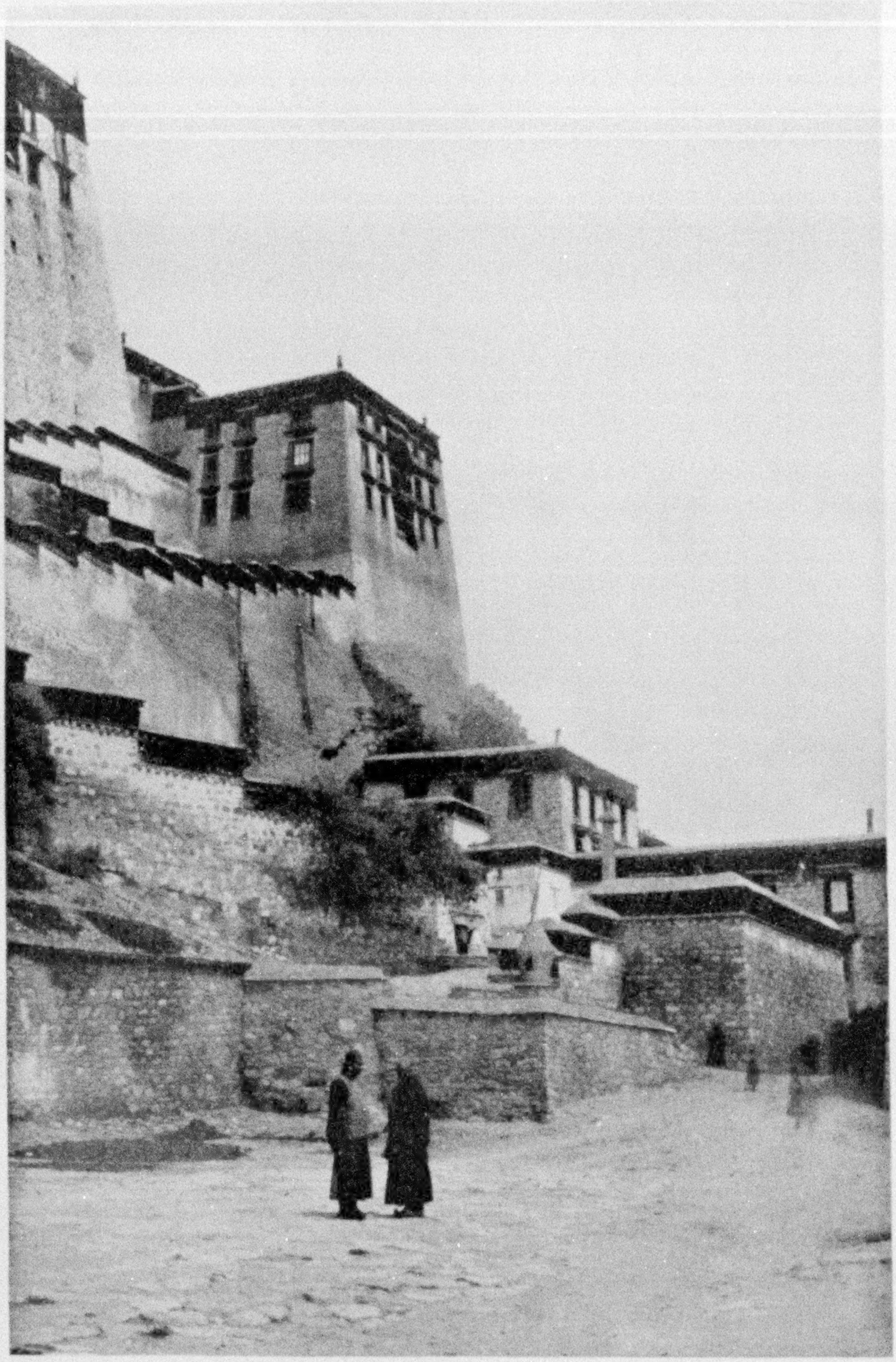
The legend runs that the island is the abode of a snake, which must be propitiated or the waters of the underground lake which lie beneath the Jo-Khang will overflow and submerge Lhasa. Doubtless the legend is founded on the fact that water lies close under the city and no well need be sunk more than 6 feet to reach the water level. When I visited the gardens the clear, brown water was extremely peaceful and reflected with added effect the beautiful coloring of its surroundings.

The quarter of the beggars, scavengers, and outcasts showed in what extraordinary hovels these people can and do live. Many of the walls of the huts were built of yaks' horns set in mud, and I need hardly say were most insanitary.

THE TURQUOISE BRIDGE OF LHASA

Not far from the Cathedral is one of the sights of Lhasa, the Turquoise Bridge, so called on account of the lovely coloring of the green blue tiles of the roof. Encircling the buildings is the Sacred Road, merely to walk along which absolves the mortal from all earthly sins, and many pilgrims prostrate themselves for its entire length, thus securing everlasting happiness in their future life.

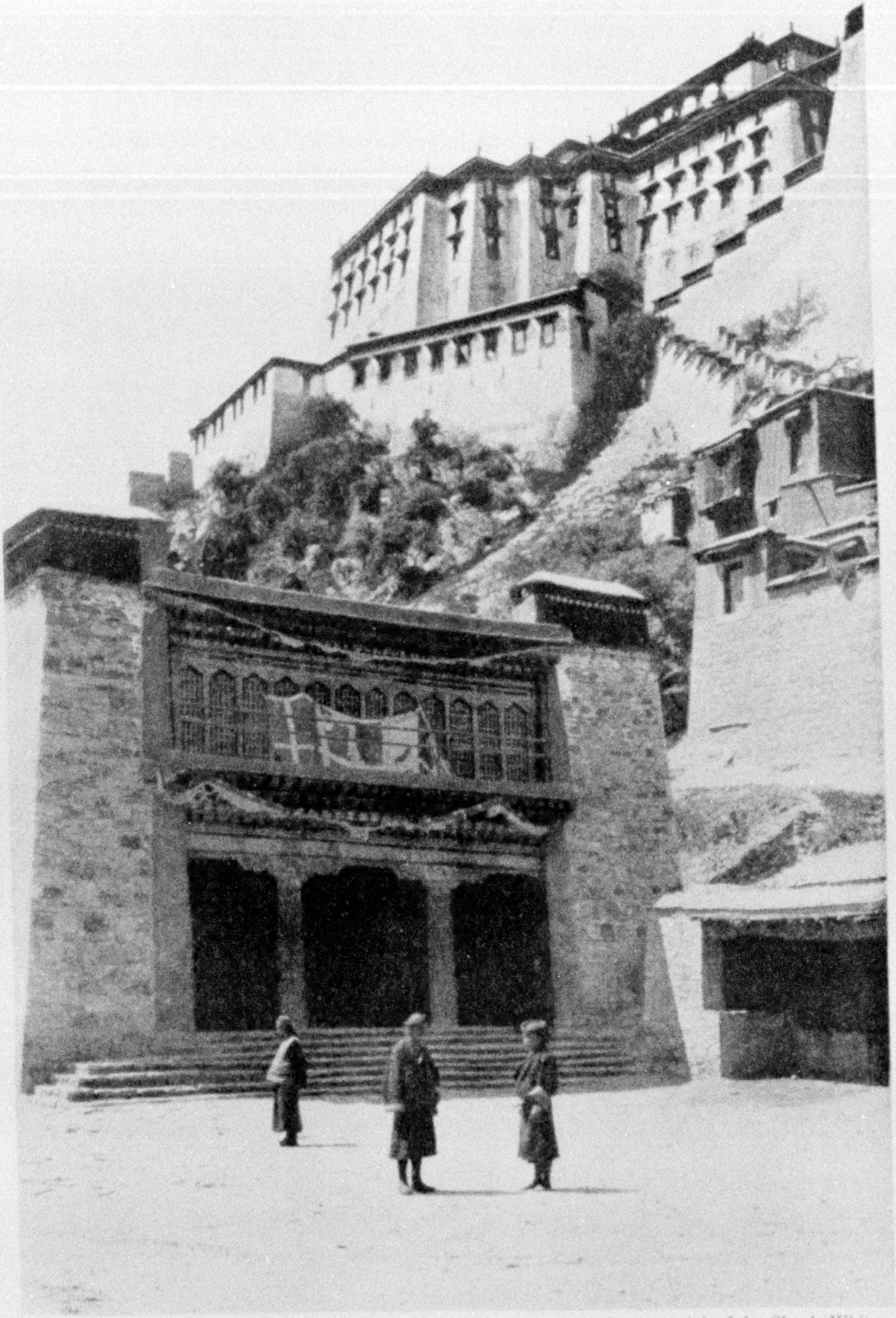
The most interesting portion of the Sacred Road is where it nears the Kyi-chhu and runs through some sharp lime-



Photograph by John Claude White

VIEW TAKEN FROM ONE OF THE COURTYARDS OF THE OFFICES ATTACHED TO THE POTALA

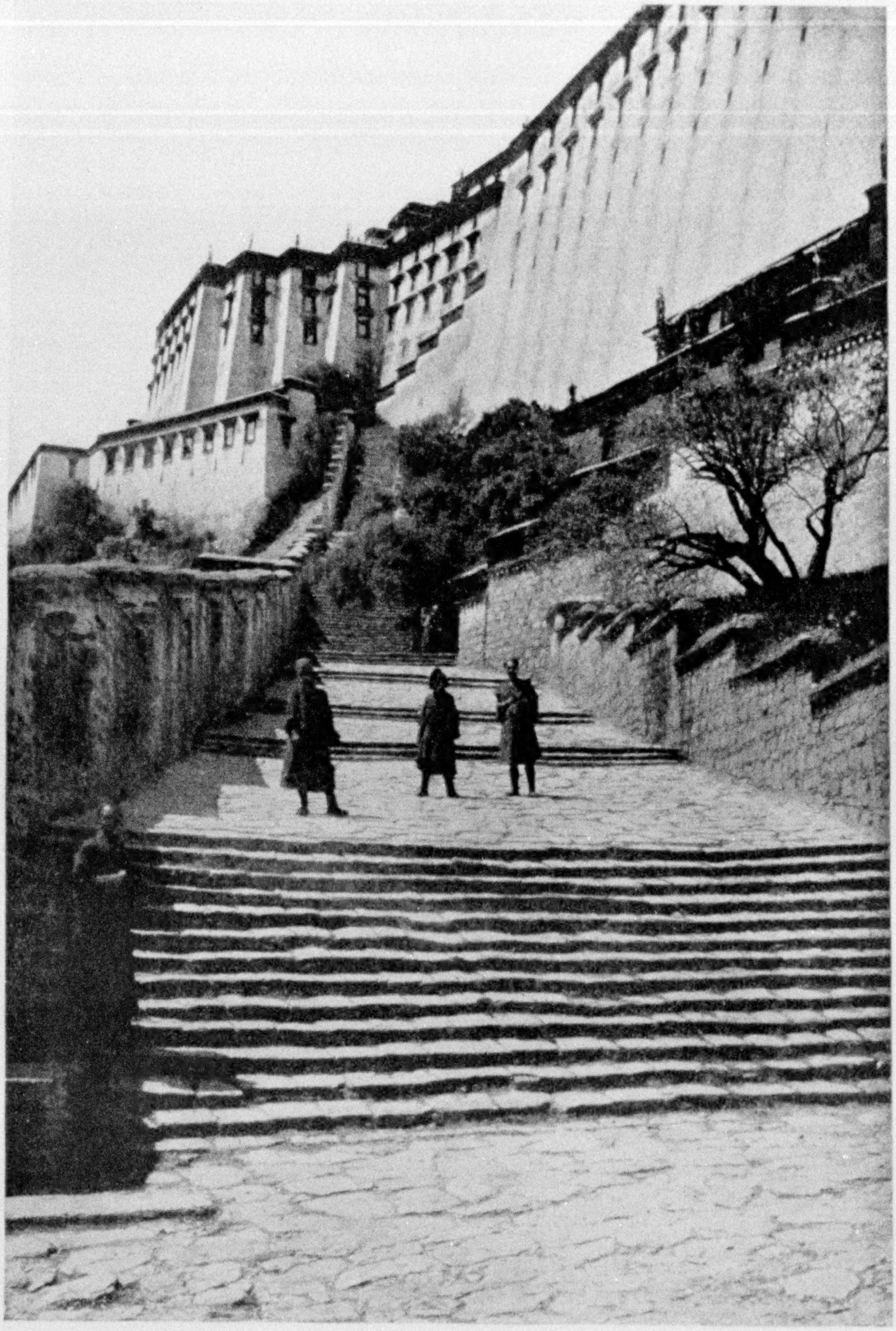
"It is indeed a fitting shrine for the heart of any religion, and with such surroundings it is difficult to understand how Lamaism could have sunk to the depths of degradation it has reached" (see text, page 273).



Photograph by John Claude White

THIS VIEW GIVES SOME IDEA OF THE HEIGHT OF THE POTALA. THE DOORS IN THE CENTER ARE THE ENTRANCE TO SOME OF THE OFFICES.

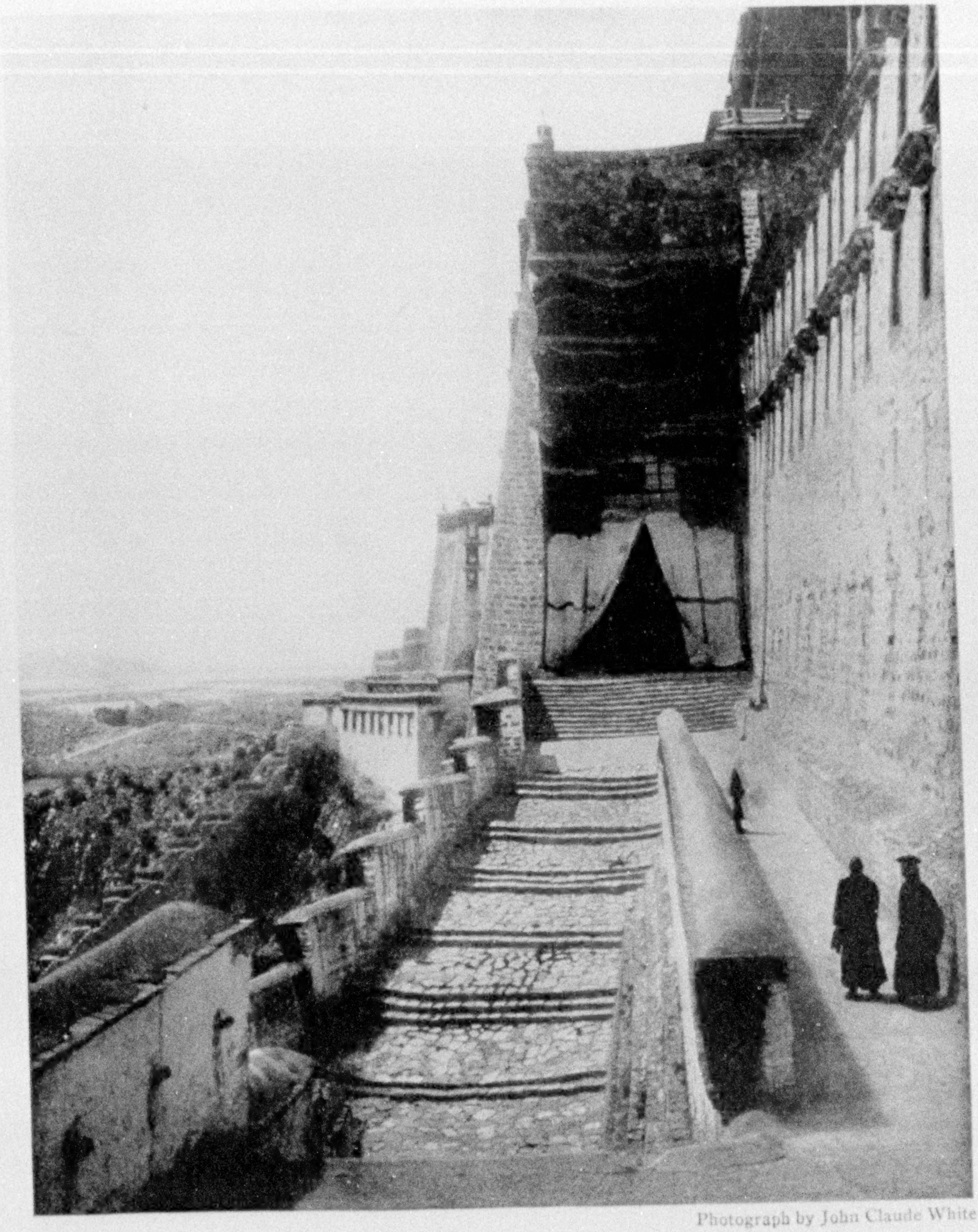
"The Potala dominates everything in Lhasa. The enormous mass of buildings, partly monastery, partly palace, and partly fortress, is built on a rocky ridge which stands out in the center of the valley, commanding the town and dominating the whole situation. Its architecture is magnificently grand, bold in outline and design; it towers above everything, with its gray white walls and buttresses, its immense flights of steps and terraces dotted with red-robed monks ascending and descending from religious ceremonies" (see text, page 273).



Photograph by John Claude White

A FLIGHT OF STEPS ON THE SOUTHWEST SIDE OF THE POTALA

This structure "is set in almost park-like surroundings of trees and meadows with snow-capped mountains on every side, and the Kyi-chhu, the River of Delight, running clear in many channels through groves of willow or poplar" (see text, page 273).



Photograph by John Claude White

AT THE TOP OF THE MAIN FLIGHT OF STEPS, SHOWING THE TERRACE LEADING TO THE MAIN ENTRANCE

This picture also shows the yak's-hair curtains hung to protect the painted carving on the entrance

Photograph by John Claude White

PRAYER FLAGS STRETCHED ACROSS AN ARM OF THE KYI-CHHU TO AN ISLAND

"All devotees, men and women, walk, always turning a small hand prayer-wheel, filled with minute prayers, printed on thin paper; and larger prayer-wheels, filled in some cases with tons of paper prayers, are set revolving by the devout, or are sometimes worked by water-power. Smaller ones are turned by the hot air rising from butter lamps" (see text, page 271).

stone rocks, carved deeply with figures of Buddha cut into the rock and painted in many colors (see pages 280 and 288).

From the rocks prayer flags are suspended on lines running to an island in the river. These prayers are universal in Tibet, and so long as they are moving they are recording prayers for the benefit of those who put them up. All devotees, men and women, walk, always turning a small hand prayer-wheel, filled with minute prayers, printed on thin paper; and larger prayer-wheels, filled in some cases with tons of paper prayers, are set revolving by the devout, or are sometimes worked by water-power. Smaller ones are turned by the hot air rising from butter lamps.

THE FAITH OF THE LAMA

Single prayers, printed on thin cloth, are strung vertically on poles or stretched across open spaces to flutter in the wind and thus send millions of prayers vibrating toward the Omnipotent for the benefit of some one's soul. They are most picturesque An old Lama I once questioned on the subject told me "that if the person turning the wheel truly believed that by doing so he was accumulating merit, it would certainly count as a meritorious action."

The three great monasteries round Lhasa, Debung, Sera, and Gah-dan, known as the Sen-de-gye-sum, exercise very considerable power.

I was asked to visit two of these monasteries—Sera and Debung—by special invitation of the Lamas, a very great honor, which I thoroughly appreciated, and I felt highly flattered to find myself known to these Tibetan monks as a result of my intercourse with their coreligionists during the years I had spent in Sikhim.

Debung, with its huge Lama population, is like a small town, with streets, alleys, and temples. The streets are steep and paved with granite blocks and the alleys are narrow and dark, and were filled with crowds of monks surging up to see the foreigner. My attendant Abbot, accompanied by lictors with large, heavy whips and under-Lamas carrying iron maces with heavily embossed copper plates ornamenting the sides, had considerable difficulty in keeping order, and the lash of the whips resounded as they laid on with no light hand to those who did not obey orders.

The Head Abbot and Lamas were in every way superior to the vast crowd of lesser monks, many of whom were of a very low type and standard generally, and they looked a villainous and truculent lot, who, I fancy, require a rule of iron to keep them in any kind of order.

I was entertained at each of the four sections of the monastery with a repast of tea, dried fruits, sweets, and murwa (a kind of beer), and I was shown several of the Lamas' cells, which, though small, were quite clean and tidy, and had each a window. The monastery has a bad reputation for lawlessness and in it all manner of plots are hatched and much wickedness goes on.

By far the most charming of the monasteries near Lhasa is that of the Chief Oracle and Magician, the Ne-chung-chos-Kyong. It lies in a small valley near Debung, with a good supply of water, and is consequently surrounded by beautiful groves of trees and lovely gardens with streams running through them. Coming upon it in the midst of a sandy plain enhances the charm of this delightful spot, and the relief it is to leave the glare and dust for its cool, shady walks.

A TOUCH OF ITALY IN TIBET

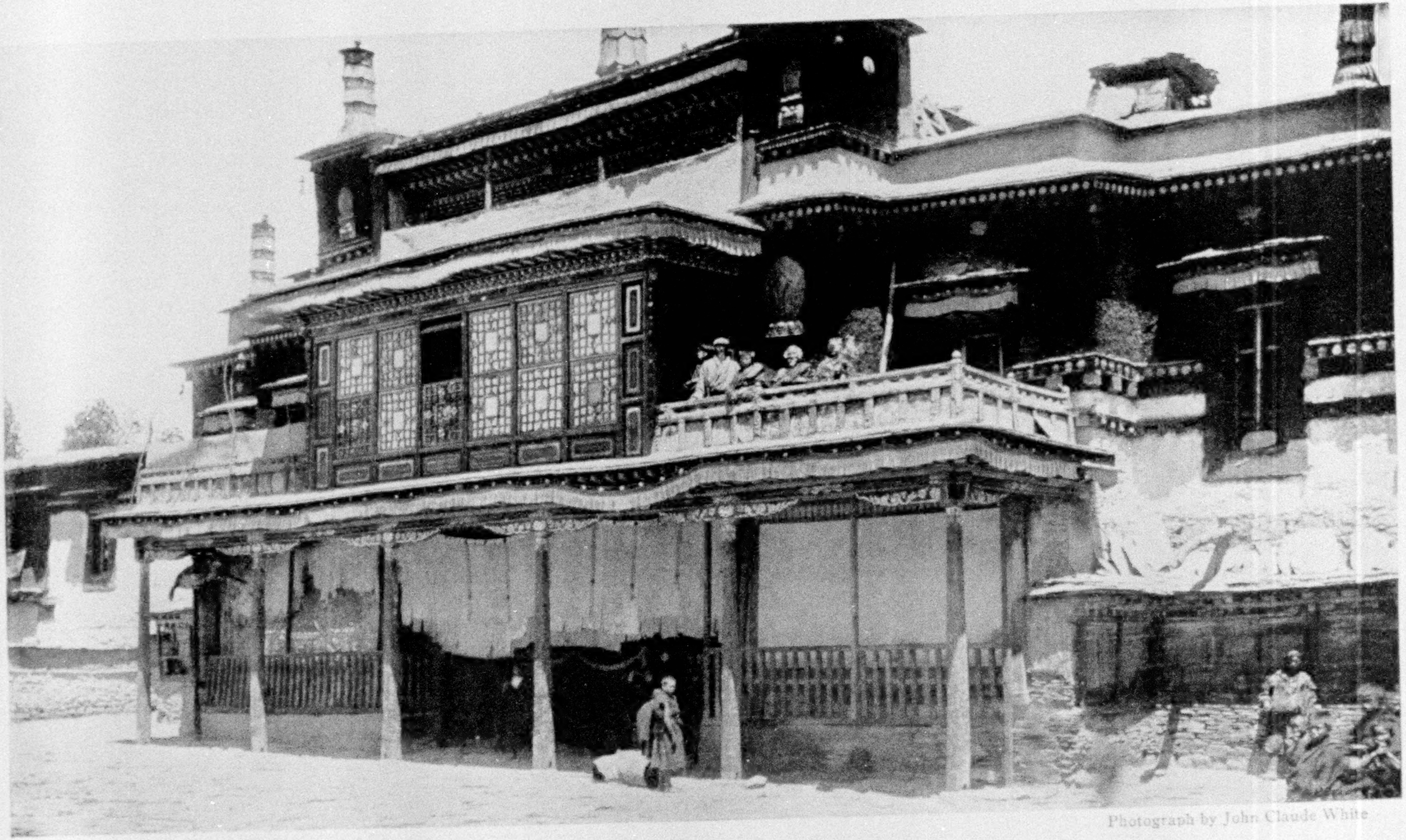
The entrance takes one through a street with houses on either side, Italian in coloring and style, and then up many steps to the principal gate. Passing through the gateway, the green luxuriance of leafy trees is in striking contrast against the whitewashed walls of the houses and the madder red of the temple itself, with the brilliant coloring of its doorways and pillars and the gold of the fantastically shaped roofs glittering in the blazing sunshine against a clear blue sky, with lines of prayer flags fluttering in every direction.

Turning up a flight of steps, the main temple is reached, passing on the way through a cloistered courtyard and a corridor supported by carved and decorated pillars, hung with ancient arms, leading

Photograph by John Claude White

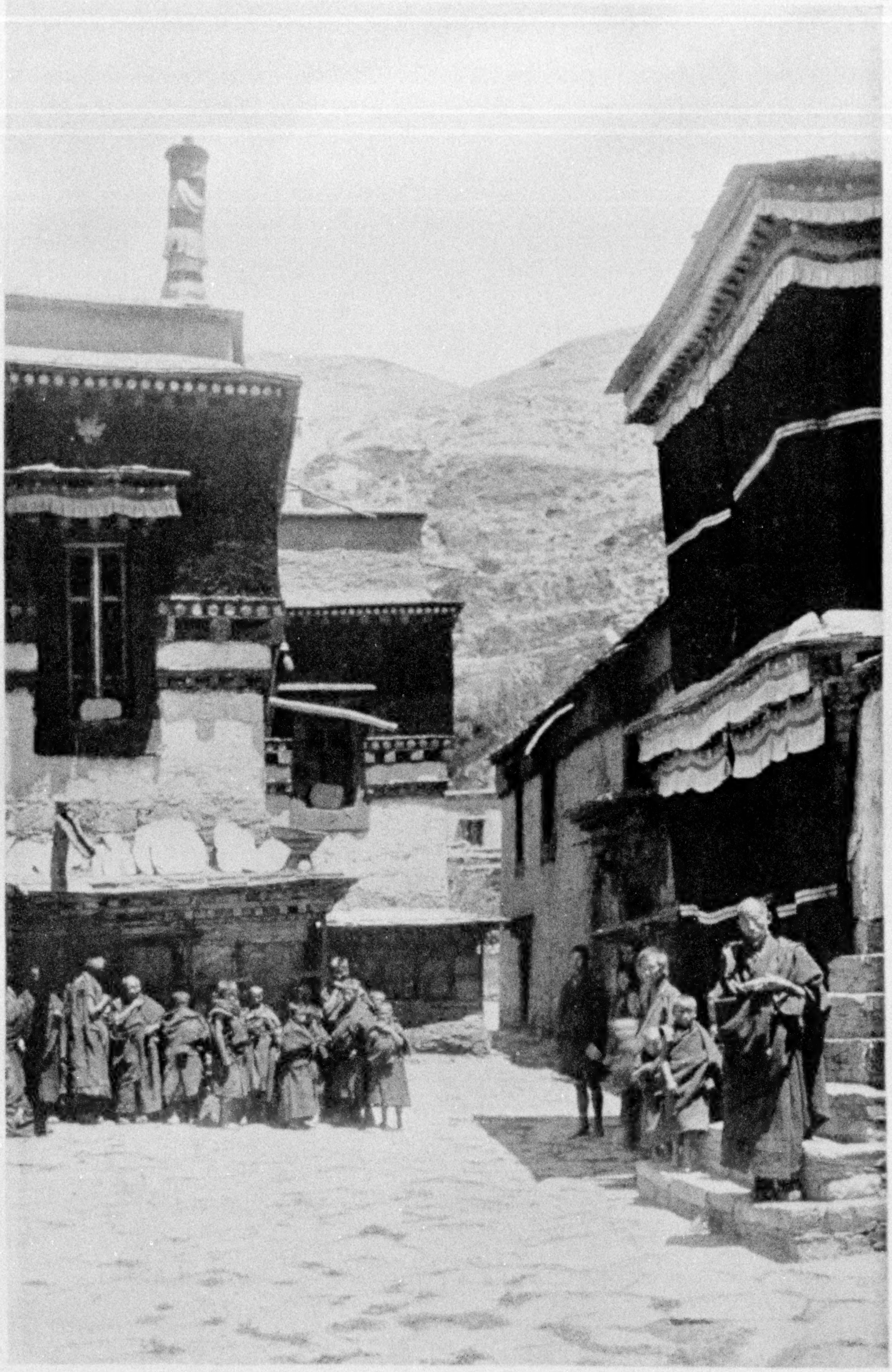
A FINE ROW OF CHORTENS ON EACH SIDE OF THE ENTRANCE TO LHA-LUNG MONASTERY: TIBET

Animal life was not very plentiful, but there were fairly large flocks of burhel (*Ovis nahura*) and a good many nyen (*Ovis ammon*) on the higher hills, and in the eastern districts I came across hundreds of the latter, as tame as ordinary sheep. On the plains Tibetan gazelle and wild asses were occasionally to be seen, but not in great numbers. The wild ass is a graceful creature of a red-brown color, with black markings and points, and very inquisitive. A herd would circle round for hours, keeping well out of range, but offering splendid opportunities for observation. There was an occasional wolf or red fox to be met with and a few Tibetan lynx. Hares abounded and large colonies of both the small and greater marmot, and in some places at the foot of the hills a good bag of partridge could be had. These, with a few Tibetan sand grouse, made up the total, though in the autumn the lakes were crowded with duck and geese. The wild birds were interesting, and there was one species which built its nest in the same burrow as the small marmot, with whom they lived on very friendly terms.



Photograph by John Claude White

COURT OF THE LHA-LUNG MONASTERY, WITH THE AVATAR, OR INCARNATE LAMA, ON THE BALCONY



Photograph by John Claude White

INTERIOR OF THE LHA-LUNG MONASTERY, WITH GROUPS OF LAMAS

The number of monks in Tibet is said to be very large, nearly 500,000 housed in 1,026 monasteries, and this out of a population of about three and one-half millions is a very large proportion and affects very adversely the country's material progress.

up to the principal doorway. Behind great hangings of black yak's hair, to screen them from the sun, are the magnificently carved doors, brilliantly colored in carmine and vermilion.

Peace reigns, the courtyard is full of flowers, and everything is quiet and orderly, conducive to the meditation which forms so large a part of the Buddhist religion.

Entering the great temple itself through the wonderful doors and passing through it, the Inner Sanctuary was reached. In it was the Golden Throne of the Chief Oracle, and on it lay his Robes of State, Sword of Office and Shield, and on all sides were the jeweled paraphernalia required for ceremonial processions and dances, so essential to Lamaism. It was evident great care had been bestowed on them, and they were specimens of beautiful workmanship and adorned with many really fine turquoise. One in particular, a circular "Mirror of Purity" of polished silver, set in copper gilt repoussé work, ornamented with turquoise, was exceptionally good.

THE MAGICIAN'S PRIVATE DWELLING

Leaving the temple and courtyard, we ascended to other temples, all elaborately decorated and beautifully kept, and then went out on the roof immediately below the Golden Roof for a nearer inspection of it and its exquisitely designed dragon-head finials. We next visited the magician's private dwelling-house, situated at the back of the main temple in a beautiful miniature garden, in which bamboos, hollyhocks, nasturtiums, stocks, and roses were all growing luxuriantly, watered by a tiny stream of clear water.

The windows were protected by delightful white awnings, and inside everything was scrupulously clean, the floors and woodwork so highly polished one felt one should do as in Japan and remove one's boots, and the walls charmingly decorated with fresco painting.

The religion inculcated by Buddha had certain cardinal points—the encouragement of the ascetic life, the maintenance of virtue, the exhortation to persons of all castes and both sexes to aim at deliverance from the evils of existence, and lastly the attainment of Nirvana.

But in Tibet Buddhism has been grafted onto the earlier devil worship of the people and a religion has been evolved better expressed as Lamaism, or modified devil worship, so that in addition to the Buddhas and Bodisats there have also come to be Tutelary and Guardian deities of a terrifying and malignant aspect, whose duty it is to defend the faith and the faithful people from external attack. These deities are depicted in grotesque and terrible forms in all the monasteries, generally in violently colored fresco paintings at the entrance.

CREDULOUS PEASANTS

The credulous peasants, steeped in superstition, look up to and pray to these monstrosities for their deliverance from evil, from the lures and persecutions of the demons and sprites, by which every Tibetan regards himself as surrounded.

The common folk believe, too, in mischievous and malignant gods, some in the shape of gnomes, some hobgoblins, others with such long slender necks and small mouths they can swallow nothing, and in their attempts writhe to such an extent their struggles cause earthquakes. Another belief is that rainbows are formed by innumerable sprites, or small folk, sliding down into water, sprites who live only on smells and twang guitars as they slide; and that drinking the water will give fever. Others living on the tops of hills or passes send down avalanches and give travelers mountain sickness, and perhaps the most dreaded of all are the "shri," who attack children.

All these beliefs are more or less the religion of the common people, combined with the hope of being perhaps reincarnated into a higher sphere and of ultimately being admitted into Nirvana.

CHARMS COULD NOT STOP NICKEL BULLETS

Tibetans have absolute faith in charms protecting them from all dangers and evils, and once during our stay when a prisoner was being treated for wounds and was asked how he, having the requisite charms from the Lamas, could have been wounded, answered that he had no charm against a nickel bullet, such metal being unknown to the Lamas.

They are strictly forbidden to take life.

Photograph by John Claude White

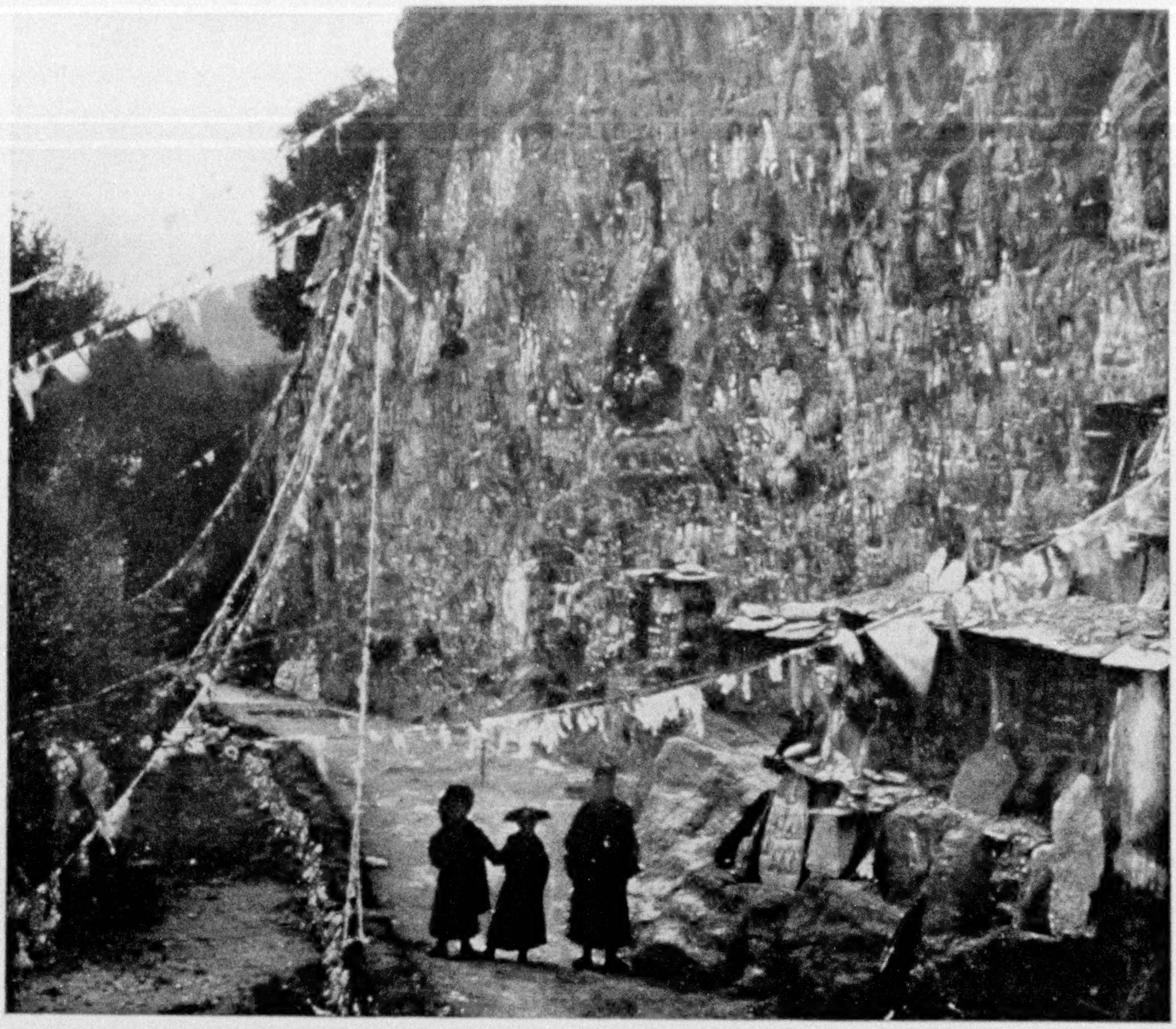
A COURTYARD IN THE NACHUNG MONASTERY, WITH LARGE NUMBERS OF PRAYER FLAGS HUNG ACROSS THE COURT: THE UPPER PART OF THE TEMPLE IS COLORED MADDER-RED

It lies in a small valley near Lhasa, with a good supply of water, and is consequently surrounded by beautiful groves of trees and lovely gardens with streams running through them. Coming upon it in the midst of a sandy plain enhances the charm of this delightful spot, and the relief it is to leave the glare and dust for its cool, shady walks.

Photograph by John Claude White

THE CHIEF ORACLE'S PRIVATE APARTMENTS IN THE NACHUNG MONASTERY

The windows are shaded by picturesque white awnings and the garden is full of flowers. The golden roofs are very fine. Around them hang numerous bells, which ring with every movement of the wind.



Photograph by John Claude White

CARVINGS ON THE LIMESTONE ROCKS ON THE LING-KOR ROAD: LHASA

These are all brilliantly colored and nearly all representations of Buddha (see page 275)

The Tibetan believes that any failure on his part to acquire merit in this world will not result in immediate punishment, but in a never-ending repetition or reincarnation in some form or other of life in this world, when his struggles will commence over again.

Their religion teaches men to attend only to their own salvation; it teaches nothing of any duty to the State or to the well-being of the community and leads to the deterioration of the nation as a whole.

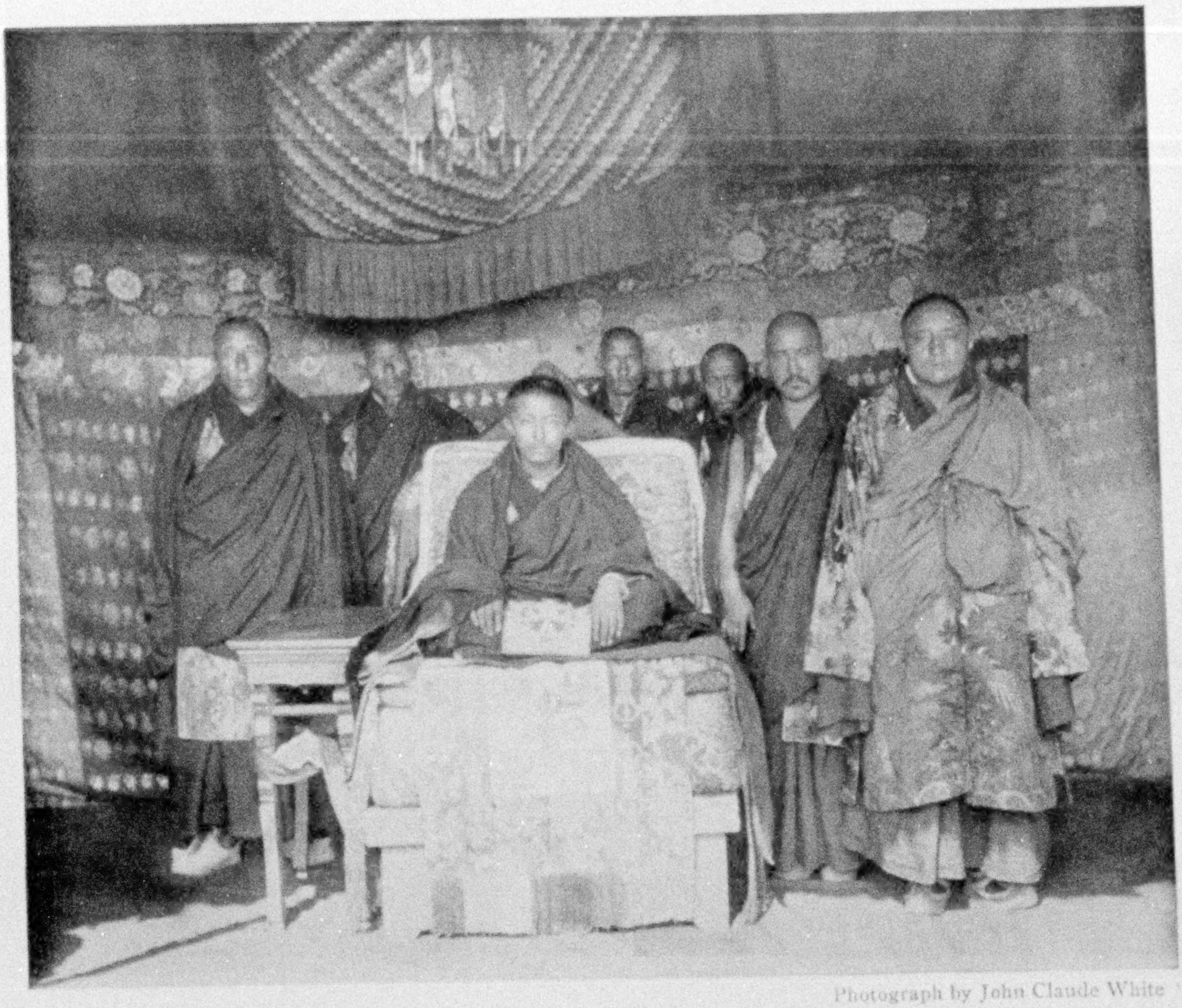
It is the usual custom for the eldest son of the family to enter a monastery, and sometimes more than one son takes to the religious life. In addition to being considered an honorable profession, it is an exceedingly lazy life and appeals to many. They are required to do nothing, while they are clothed, housed, and fed at the expense of the State.

Many of the monasteries are supposed to have schools, but they are of no use and teach nothing of any practical value. All kinds and conditions of men are admitted and the result is not satisfactory, as the bulk of those I saw in the large monasteries were a degraded and in many cases a bestial lot.

ONE-SEVENTH OF THE PEOPLE ARE MONKS

The number of monks in Tibet is said to be very large, nearly 500,000 housed in 1,026 monasteries, and this out of a population of about three and one-half millions is a very large proportion and affects very adversely the country's material progress.

The Tashi and Dalai Lamas never die,



Photograph by John Claude White

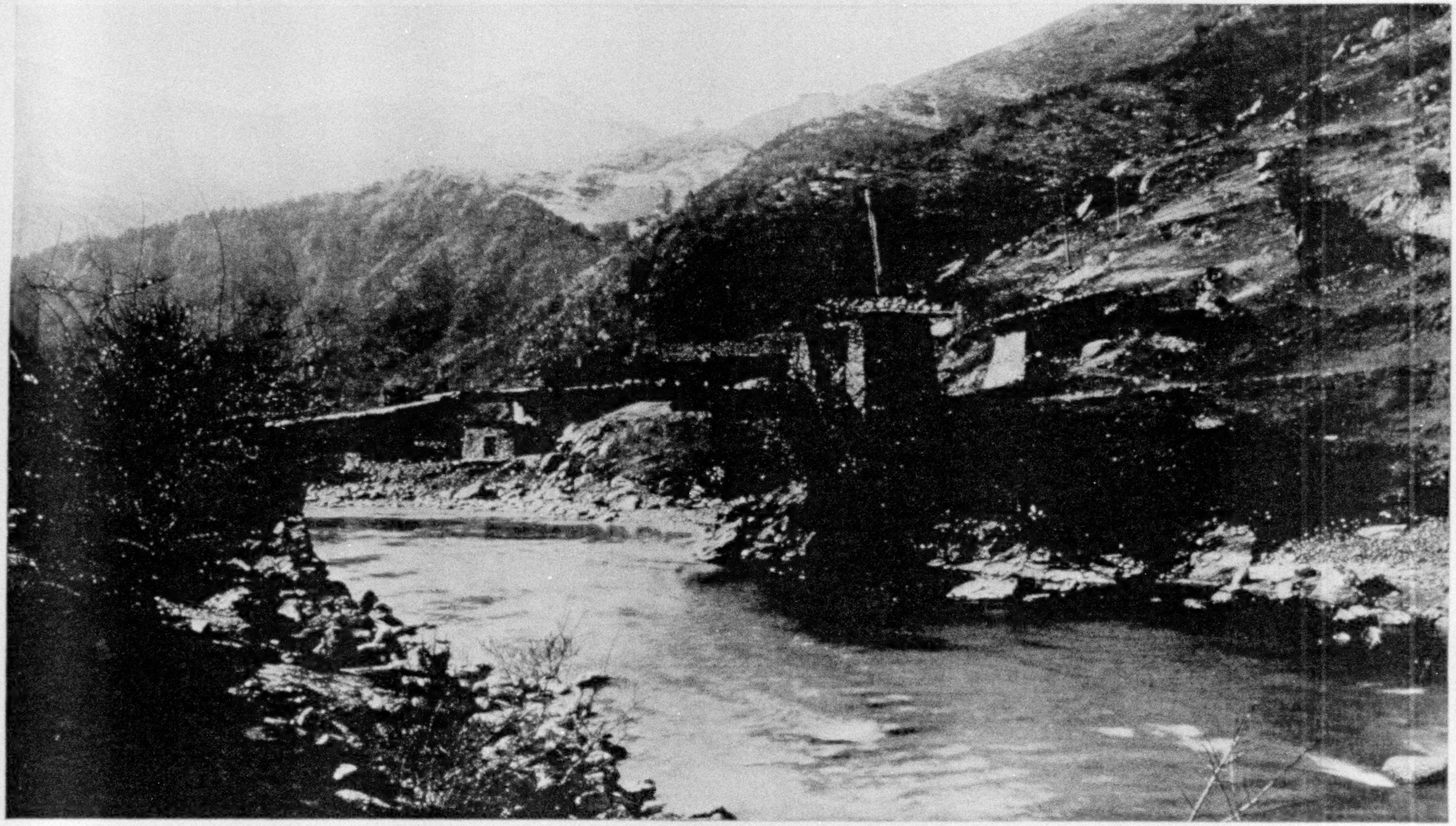
A PORTRAIT OF THE TASHI LAMA WITH HIS MINISTERS AND FOLLOWERS

as their souls on departing the life are reincarnated in the body of some infant, who by some miraculous sign, such as the recognition of a rosary, an article of clothing belonging to the deceased, or something of that sort, establishes his claim.

Mr. Wilton tells us how the Chinese manipulate the selection to insure the chosen candidate belonging to the pro-Chinese faction. When the choice has been narrowed down to four, four fish-shaped tablets are publicly placed in a golden urn, the gift of the Great Manchu Emperor Kienlung. The name inscribed on the first tablet drawn is hailed as the Dalai Lama, and it is the custom to solemnly recommend him for confirmation to the Chinese Emperor by the Amban.

Kienlung's method of choice of a Dalai Lama was intended to prevent a selection likely to be detrimental to Chinese interests, and this is how it was carried out: The selection of the infant was left entirely in the hands of the Tibetans; only the final putting in of the four fish tablets was superintended by the Tibetan Regent and the Chinese Amban. The actual drawing was done by a Tibetan; but to insure the right candidate, all four tablets were inscribed with the same name.

The last four Lamas—ninth, tenth, eleventh, and twelfth—have all died before attaining their majority, 18 being the age of majority for a Dalai Lama. It was prophesied in Lhasa ten years before the present incumbent's selection, in 1876, that he would be the last of the Dalai Lamas, and, as events have turned out in China during the last few years, it is more than likely we shall not see another.



Photograph by John Claude White

A VERY GOOD EXAMPLE OF THE CANTILEVER PRINCIPLE AS APPLIED IN THIS PART OF THE WORLD (TIBET)

The hills in the background are those crossed by the Jeylap-la and Natu-la passes. Both of these passes are over 14,500 feet and very difficult, especially in winter, when they are often blocked for days together by deep snow.

Photograph by John Claude White

SOME OF THE NUNS OF THE TA-TSHANG NUNNERY

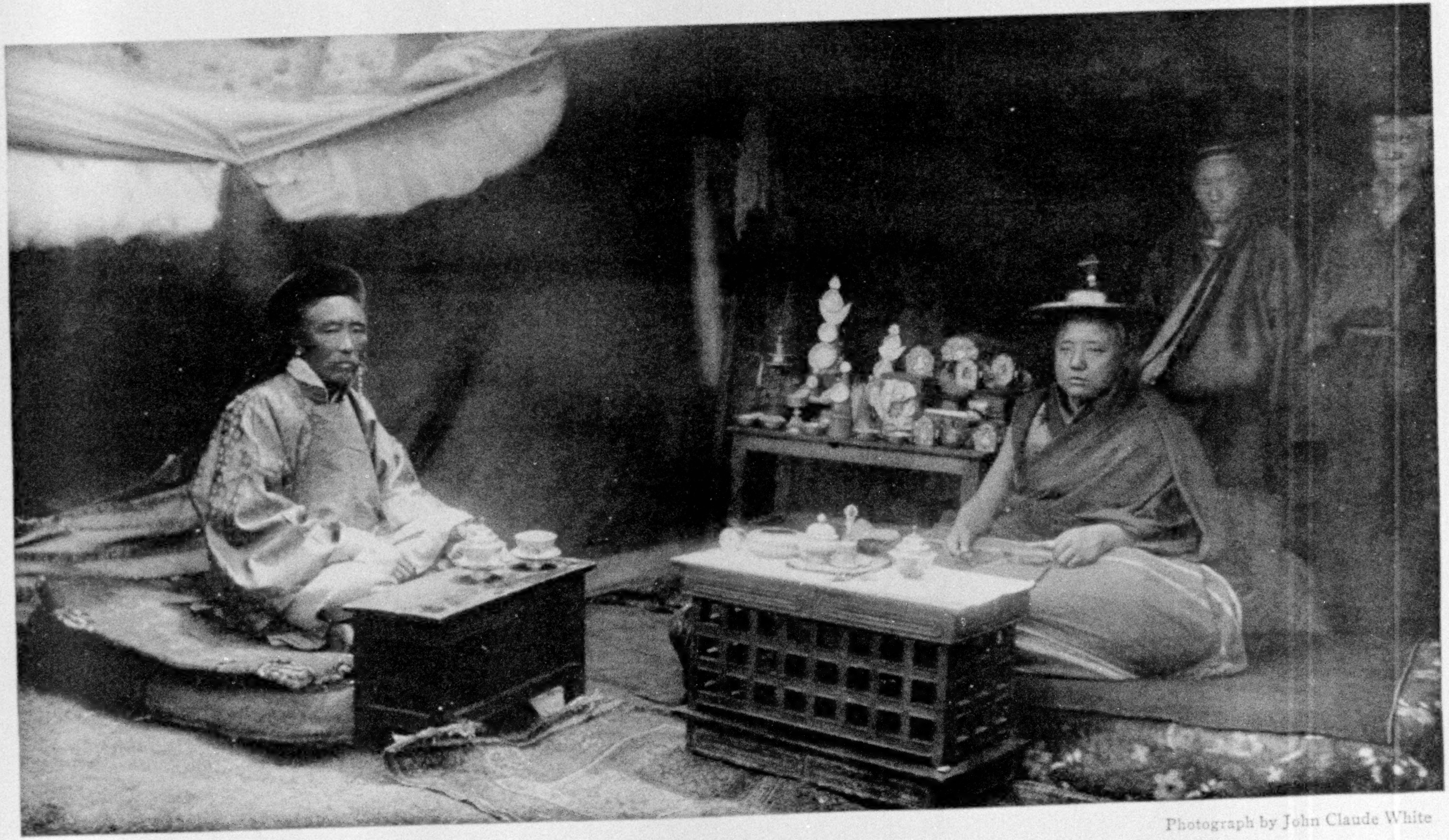
Their head-covering is made of sheep's wool. Carved on the stones is the sacred formula, "Om-mani-pade-hum" (Oh, the Jewel in the Lotus). Not very far from Khamba Jong was the nunnery of Ta-tshang, situated in a most dreary spot, with not a single habitation in sight; and in winter it must be a terrible place, wind-swept in all directions except the north. The nuns, however, seemed quite happy and contented, though they are the dirtiest lot of women I have ever seen, and after visiting the interior of the building and seeing the refectory we were thankful to be in the open air again.

XUM

Photograph by John Claude White

A FINE SPECIMEN OF A TIBETAN FORT: TUWA JONG AND MONASTERY

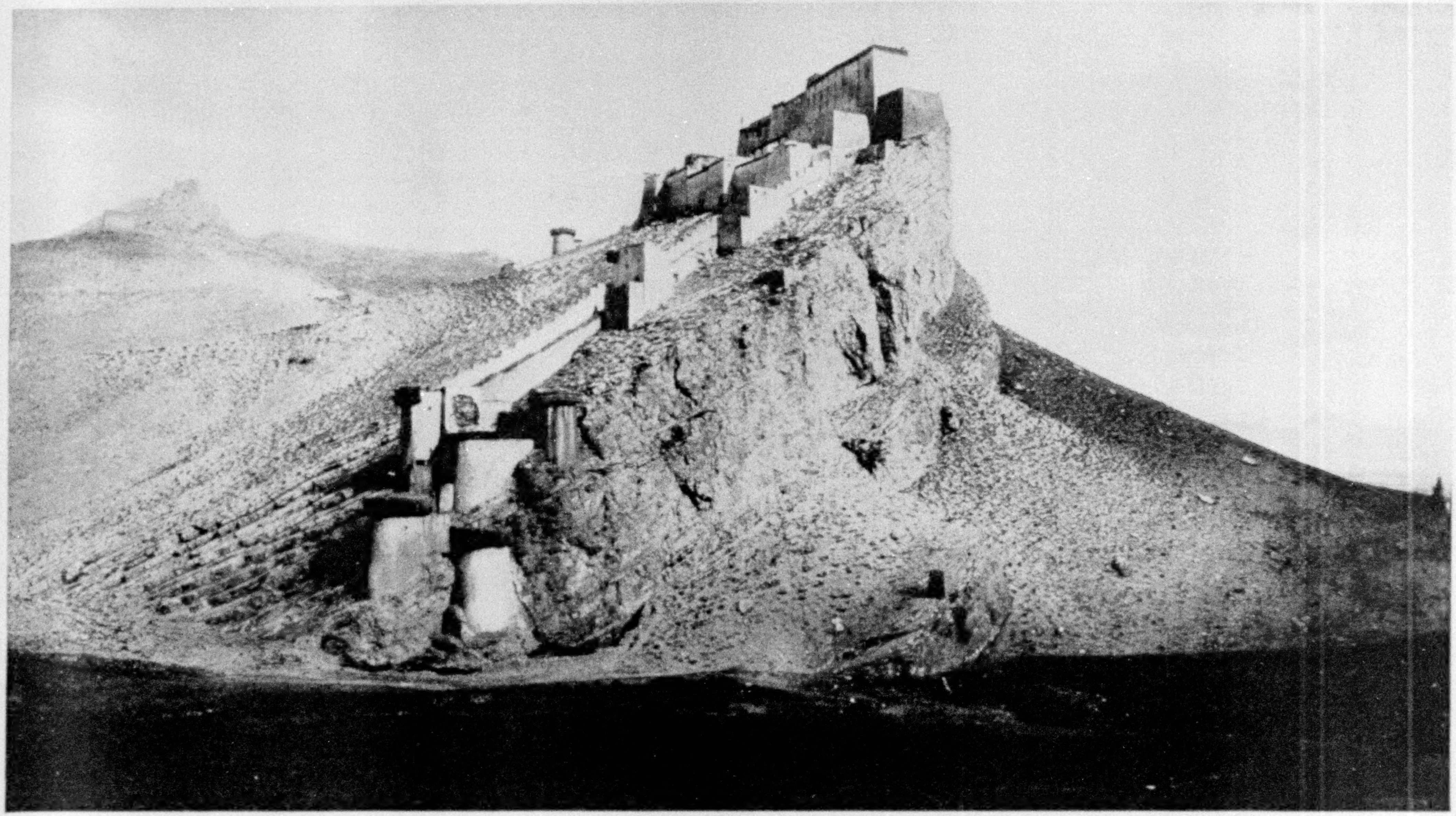
The trees here are willows. The power of the sun is so great in this clear atmosphere that at the present day, at the height of 15,780 feet, barley ripens in irrigated fields along the southern slopes of the limestone hills on which the fort is built, and in a sheltered corner below the jong there are very old willow trees with gnarled and twisted trunks; a few miles away, in some sandy hills, there is quite a forest of juniper with trunks, though stunted, running to 18 inches in diameter. Another marked and common feature in some of these elevated wind-swept plains are the bright yellow sand-hills, which are almost all crescent-shaped and at right angles to the prevailing wind, many of them rising 80 or 100 feet in height in the center.



Photograph by John Claude White

THE SHIGATSE ABBOT IN HIS TENT AT KHAMBA JONG

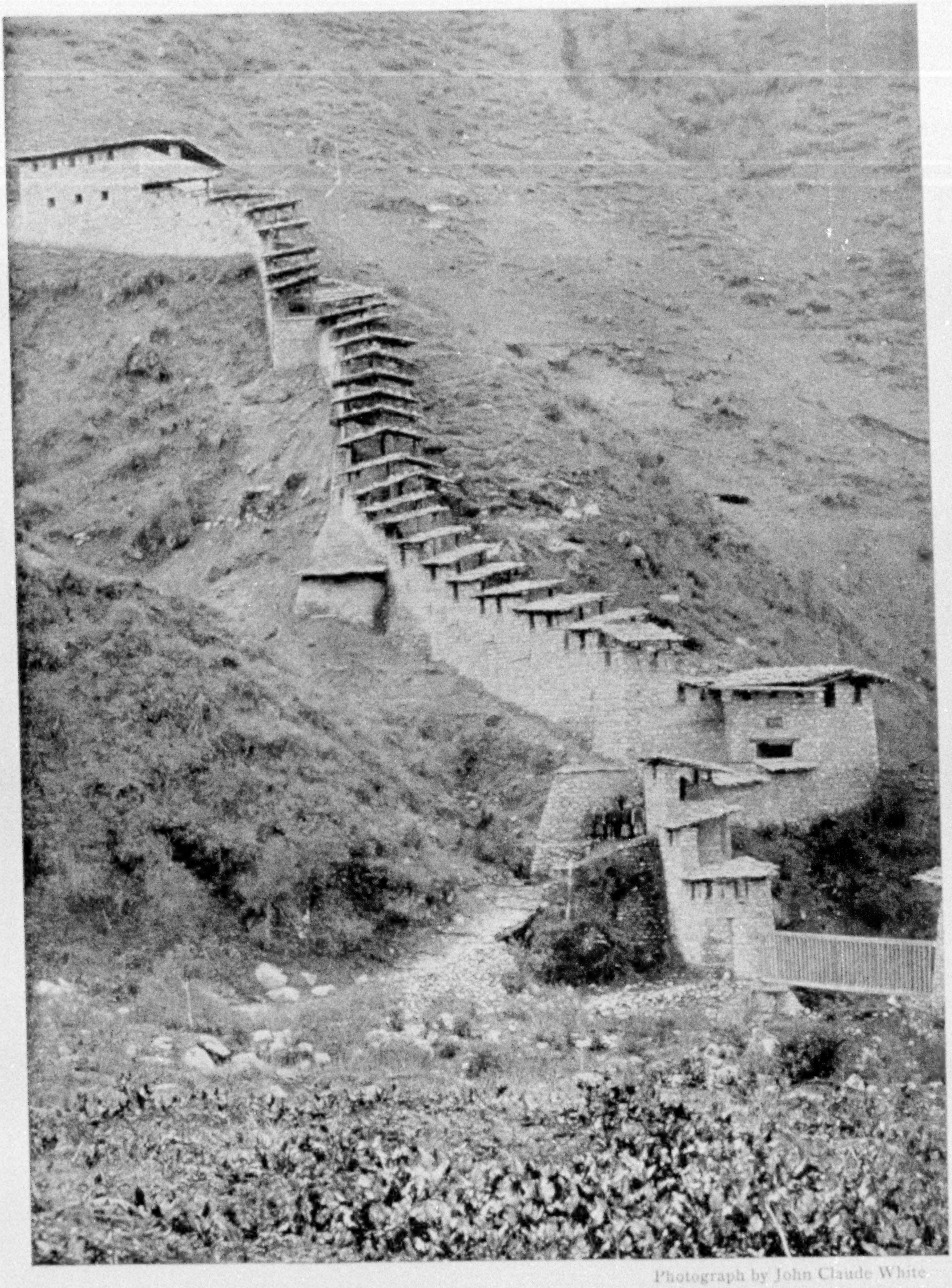
This Tibetan Abbot is the third man in importance in Tibet. He came to the camp with his secretary, who is seen seated with him. Our camp was unusual—unique, I think I may say—lying, as it did, at an elevation of 15,870 feet, higher than Mont Blanc, in an almost level plain, with a magnificent panorama of the Himalayas stretched out before us to the south; Kinchenjunga, 28,156 feet, and Mount Everest, 29,002 feet, the highest mountains in the world, distinctly visible, while behind us rose sharply the picturesque building of Khamba Jong, built on an overhanging limestone cliff.



Photograph by John Claude White

VIEW OF THE FORT OF KHAMBA JONG, BUILT ON A PRECIPITOUS LIMESTONE CLIFF AT AN ELEVATION OF NEARLY 16,000 FEET, IN TIBET, 20 MILES FROM THE INDIAN FRONTIER

The origin of the jongs, or forts, which are dotted all about this part of Tibet, is very obscure, and I could get no history of this one. The Jong-pen, or governor, evidently knew nothing, nor could he produce any old documents which could throw any light on the subject. My observations led me to believe that in the not very distant past these regions received a much larger rainfall than they do at present. With this heavier rainfall, there was better grazing and consequently a far larger population, and this is proved by the very large number of deserted villages and houses to be seen in all directions, as well as by the old water channels for carrying water to cultivated areas. There are thousands of houses in these valleys now standing empty. These forts were a necessity in more prosperious times, when the population was comparatively great, and were required for protection against raids as well as for administrative purposes.



Photograph by John Claude White

THE WALL ACROSS THE ROAD AT YATUNG, IN TIBET

We found some remarkable hot springs not far from here, the water in some cases registering boiling point. Many Tibetans congregate round these springs to bathe, and the water, which is highly charged with sulphur, is considered specially efficacious in cases of skin disease. Bathing is a simple proceeding on their part. All that is considered necessary is to scoop out a depression in the deposit round any spring, and this, filled with water, makes the bath. A tent is sometimes thrown over it, and the whole family—men, women, and children—sit for hours in the steaming water, and they certainly look a different color after a prolonged immersion, the process removing several layers of dirt.

VOICE VOYAGES BY THE NATIONAL GEOGRAPHIC SOCIETY

A Tribute to the Geographical Achievements of the Telephone

PERHAPS never before in the history of civilization has there been such an impressive illustration of the development and power of human mind over mundane matter as was demonstrated at the annual dinner of the National Geographic Society, at the New Willard Hotel, in Washington, on the evening of March 7, the fortieth anniversary of the award of the patent for the invention of the telephone to Alexander Graham Bell.

The occasion was in itself inspiring. Science, art, diplomacy, statecraft, and business had sent their most distinguished representatives to join with the Society in honoring those whose services to civilization had been so far-reaching and which were to be so dramatically demonstrated during the evening. From the four corners of the country had come a nation's elite to join with the Society in crowning with the laurels of their affection and admiration the brilliant men whose achievements had made possible the miracles of science that were to be witnessed.

And if the occasion was impressive and its setting inspiring, the events of the evening were dramatic beyond measure, for it seemed indeed that at last fact had outrun fancy, and that imagination had acknowledged the supremacy of actuality.

LATTER-DAY MIRACLES

Small wonder was it that at the evening's close the men who help guide the destinies of the nation had in subdued emotion declared that they felt "humbled and meek and overwhelmed!" What wonder that they in amazement exclaimed to one another, that in view of the things their eyes had seen and their ears had heard, "no man can say that anything is impossible!"

What wonder, indeed, was it that men declared that it might yet be possible to talk to Mars if it were inhabited; what wonder that they had come again to believe in fairies—only that these fairies were no longer creatures of the unseen world—but men with super-minds like Marconi, Vail, Carty, and Graham Bell; what wonder that men pronounced what they beheld as latter-day miracles, or that many men and women present felt that they were dining amid scenes closely bordering the supernatural!

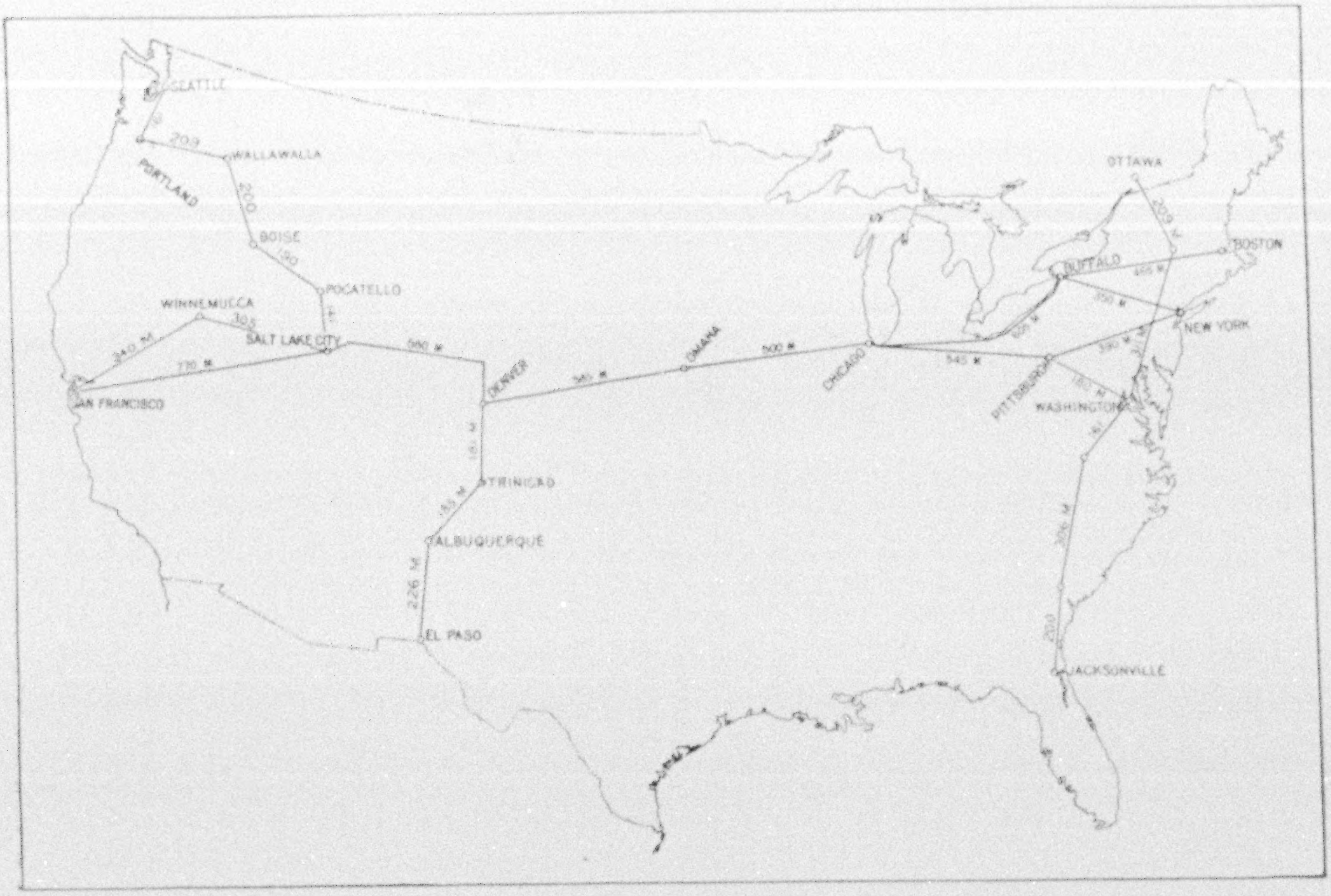
For had they not heard the living voice across a continent! Had they not had brought home to them the fact that in the twinkling of the eye their voice had swept from sea to sea, across high mountains, low plains, prairies, and plateaus!

Had they not heard the Pacific's surf beat upon its rockbound coast, while they themselves were on the very threshhold of the Atlantic!

Had they not, indeed, heard and added their own voices to the strains of the Star Spangled Banner played by a phonograph at Arlington, Virginia, and carried to New York by wireless and back to Washington by wire, in all its sweetness, with all its inspiration, and breathing patriotic faith—carried there at a speed that made the "wings of the wind" a misfit metaphor!

Think of a diner in that banquet hall hearing the strains of that music, after they had traveled four hundred miles, half way by wire and the other half by wireless, before they could reach the ear of a person at the very foot of the tower whence they started!

The dinner was given in honor of the achievements in the art of telephony



MAP SHOWING VOICE VOYAGES MADE BY THE NATIONAL GEOGRAPHIC SOCIETY FROM WASHINGTON TO PITTSBURGH, CHICAGO, OMAHA, DENVER, SALT LAKE CITY, SAN FRANCISCO, PORTLAND, SEATTLE, EL PASO, OTTAWA, JACKSONVILLE, AND INTERMEDIATE POINTS

through the forty years that have passed since Alexander Graham Bell first solved the problem of sound transmission by electricity.

The telephone paid tribute to Dr. Bell, its father, by transmitting with equal fidelity the sound of music, the roar of breakers, and the intonations of the human voice. It paid its tribute to President Vail by proving that it indeed had grown to be a national institution in its geography, in its use, and in its possibilities. It paid its tribute to the great engineering staff, headed by John J. Carty, by demonstrating that it had, through them, ceased longer to be dependent on wires, but could now make the Hertzian waves its messengers—messengers which can travel eight times around the earth between the beats of the human heart.

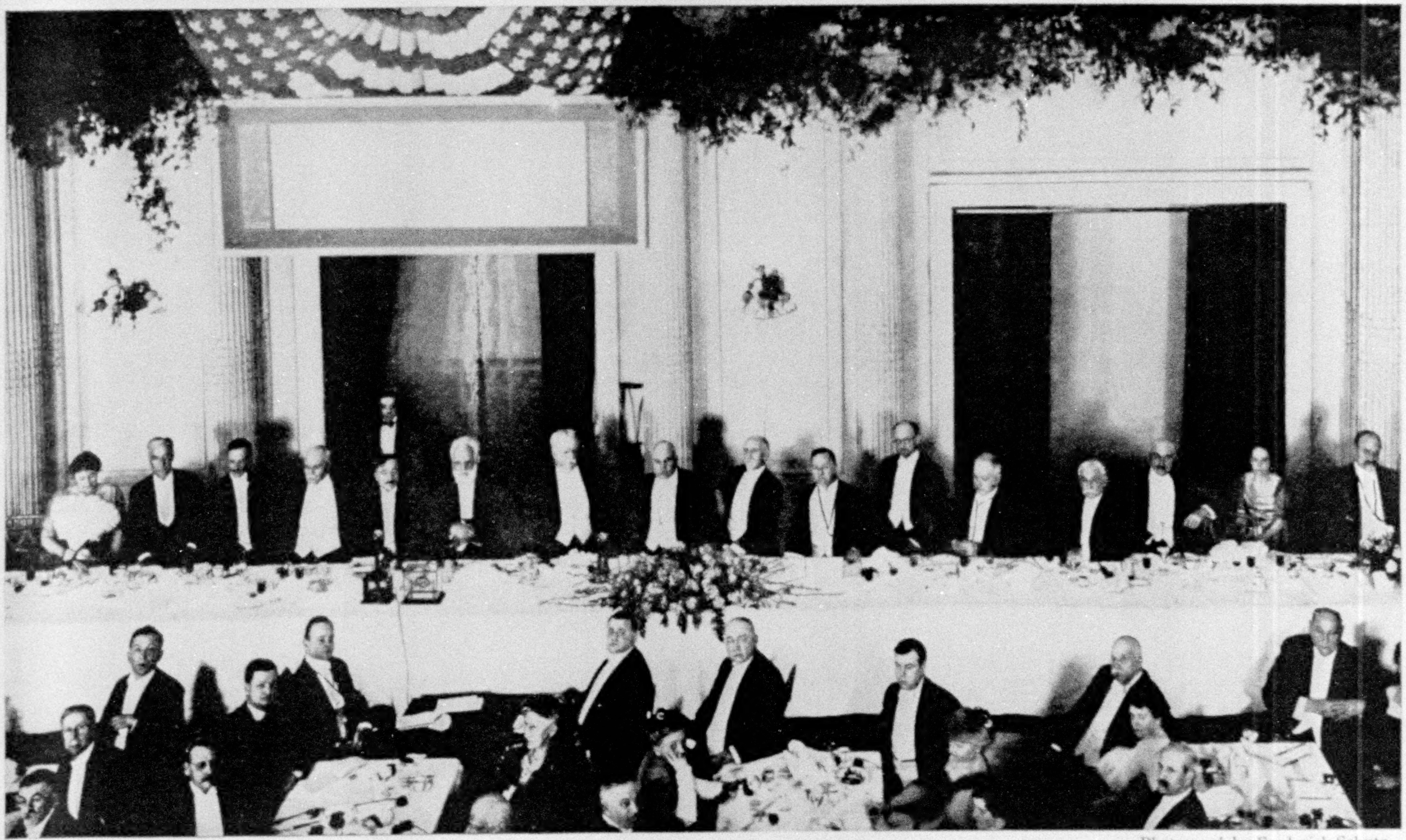
The big banquet hall of the New Willard is nearly a city block long and perhaps sixty feet wide. Eight hundred people were seated around the tables of the huge gridiron, each with a telephone receiver at his elbow. At the one end of the great hall was a large map, with electric lights marking every junction station on the transcontinental voice highway, from Florida to Puget Sound and from Ottawa, Canada, to El Paso, Texas.

VOICE VOYAGES TO SEATTLE

After the courses had been served, the chief of the engineering staff of the American Telephone and Telegraph Company, Mr. John J. Carty, announced that the assembled guests would take a voice voyage to Seattle, Washington. Eight hundred receivers went to eight hundred wondering ears and the transcontinental roll-call began.

"Hello, Washington, D. C.," said Mr. Carty.

"Hello, Mr. Carty; this is Washington; Truesdale speaking," came the answer. And the bulb indicating the Nation's Capital on the electric map grew bright.



Photograph by Frederick Schutz

SOME OF THE GUESTS AT THE SPEAKERS' TABLE

Left to right: Mrs. Franklin K. Lane, Mr. Thomas A. Watson, Mr. Gilbert H. Grosvenor, Editor and Director National Geographic Society; Major General Hugh L. Scott, Chief of Staff and Acting Secretary of War; Mr. John J. Carty, Chief of the Engineering Staff of the American Telephone and Telegraph Company; Dr. Alexander Graham Bell; Mr. Theodore N. Vail; Secretary of the Interior Franklin K. Lane; Mr. O. H. Tittmann, President National Geographic Society; Secretary of the Navy Josephus Daniels; Mr. U. N. Bethell; Postmaster General Albert S. Burleson; Rear Admiral Colby M. Chester, U. S. Navy; Mr. N. C. Kingsbury; Mrs. Albert S. Burleson; and Senator Joseph E. Ransdell. The square, dark "box," with cord attached, in front of Mr. Carty, is an exact duplicate of the first Bell telephone. Through this instrument Dr. Bell talked from New York to San Francisco when the transcontinental line was opened January 25, 1915 (see pages 313 and 315).

"Hello, Pittsburgh," called Mr. Carty.

"Hello, Mr. Carty; this is Pittsburgh; Meighan talking," came the reply.

"What is the temperature there?" inquired Mr. Carty, "and the weather?"

SPANNING THE CONTINENT

One by one, without a moment's loss of time, they came in—Chicago, Omaha, Denver, Salt Lake City, Pocatello, Boise, Walla Walla, Portland, and finally Seattle—and in the time that it takes to tell it the guests had swept on an ear voyage to the Northwest Pacific region, and 11 twinkling lights aglow on the electric map showed in how many places the diners had been transported as hearers in those few minutes. In truth, the human voice was speeding from ocean to ocean, stirring the electric waves from one end of the country to the other, and greeting every ear that was on the line to hear.

GREETINGS FROM CANADA

After thus sweeping across the continent, the dinner party started upon an invasion of foreign soil. In less time than it takes to tell it, the voice dispatchers had perfected a through route from the capital of the greatest nation to the capital of her greatest neighbor. Washington was in whispering distance of Ottawa.

And from Ottawa came messages of international amity and good-will that were heartily reciprocated by all present. "The Postmaster General of Canada sends greetings," came the voice from Ottawa, "to the Postmaster General of the United States, and trusts that for the common good of the two neighboring peoples the cordial relations which have always existed between the two departments will endure for all time."

And then from the Rt. Hon. Sir Robert Borden, Prime Minister, came hearty greetings to the National Geographic Society, a tribute to its work, and a word of hope and forecast for its future.

"My greetings," read the message, "to the National Geographic Society and my congratulations on their achievements of another successful year. In speaking through word of mouth across so many miles, it is a pleasure to recall that the distinguished scientist and inventor who has made this wonderful feat possible and who has been one of the guiding spirits of your Society has also had ties of close association with Canada. One of the objects of the National Geographic Society is to increase our knowledge and comprehension of the various countries of the world. The value of such knowledge is inestimable, and I would bespeak for your efforts an even greater influence and appreciation in the future."

FROM THE MEXICAN BORDER

"There shall be no North and no South," declared a patriot years ago; and there was not at the Geographic dinner, for as soon as the voice-visit to Ottawa was over the party proceeded to the Rio Grande at El Paso. Flashing by Pittsburgh, Chicago, Omaha, Denver, Trinidad, and Albuquerque with a word of greeting to each, Washington was in a minute speaking into the ears of men hundreds of miles apart and hearing a chorus of voices from five different States.

"Is General Pershing there?" inquired Mr. Carty of El Paso.

"Yes, sir," answered Mr. Roach, several thousand miles away.

"Hello, General Pershing!"

"Hello, Mr. Carty!"

"How's everything on the border?"

"All's quiet on the border."

"Did you realize you are talking with 800 people?"

"No, I did not," answered General Pershing. "If I had known it, I might have thought of something worth while to say."

"Well, you know it now, so you can say it," advised Mr. Carty.

"My greetings to the National Geographic Society. I have attended some of its great dinners and know what impressive functions they are. I am a member of the Society and esteem it a rare privilege to help further its splendid work."

And there were cheers at the sentiment, just as though the words had come from the speakers' table instead of from El Paso.

"General Scott, Acting Secretary of War and Chief of Staff, is here, General Pershing," said Mr. Carty, "and he will talk with you."

But General Scott was too modest. He could fight Indians, put an army through its maneuvers, and march into the "inferno of a fight" without turning a hair, but he could not talk to one of his generals over a telephone on such an occasion as this.

After El Paso, Texas, came Jacksonville, Florida, and while a chilling March rain was falling in Washington it was a balmy summery night in Jacksonville, with the thermometer registering 70-odd.

And then the tide turned again. A switch in Washington moved and the voice-tide turned from the far Southeast to the extreme West. To Salt Lake City the route was the same as we had taken to Seattle, but there a switch was thrown and we were routed to San Francisco.

When we got there lights were shining on the electric map at 21 places in 17 States and one foreign country. We had visited them all on our dash around the country on the wings of the electric wave.

When we arrived in San Francisco, the toastmaster, Secretary of the Interior Franklin K. Lane, informed that city that the whole National Geographic Society envied those who lived there.

And then came Captain Gilmer, U. S. N., to the San Francisco telephone, and soon the head of the Navy at the Atlantic seaboard was conversing with one of his captains on the Pacific seaboard as though they were in adjoining offices instead of thousands of miles apart.

A VOICE FROM THE GOLDEN GATE

And then the voice of war yielded place to the voice of filial affection, and out of the Washington receivers floated a piping "Hello, mamma! How are you and daddy? I'm just fine." It was little Larry Harris, five years old, in San Francisco, calling to his mother, who, visiting in Washington, was one of the guests attending the Society's dinner.

Mrs. Lawrence W. Harris: "Where is King? Is King there?"

King: "I am, mamma."

Mrs. Harris: "Hello, King; how are you? King, we will see you in about two weeks. Your daddy wishes to speak to you."

Mr. Harris: "Hello, King; how are you, my boy? Who are you with?"

King: "I am with grandma."

Mr. Harris: "Well, you tell your grandma that this is no time for her to be out. Good-bye, boy."

Mr. Carty: "Mr. Harris didn't realize that it is now only half-past seven in San Francisco."

The voice of the little fellow and his brother King, age three, captivated 800 people and brought earnest applause as they at half-past seven in San Francisco said good-night to their parents at half-past ten in Washington.*

After the conversation was done, Washington began to say good-night to all of the stations with which it had talked, starting with San Francisco and coming east.

"Good-night, San Francisco," said Mr. Carty.

"Good-night, Mr. Carty," answered San Francisco, as her light on the electric map became dark. And so we said good-night to all of them.

TALKING WITHOUT WIRES

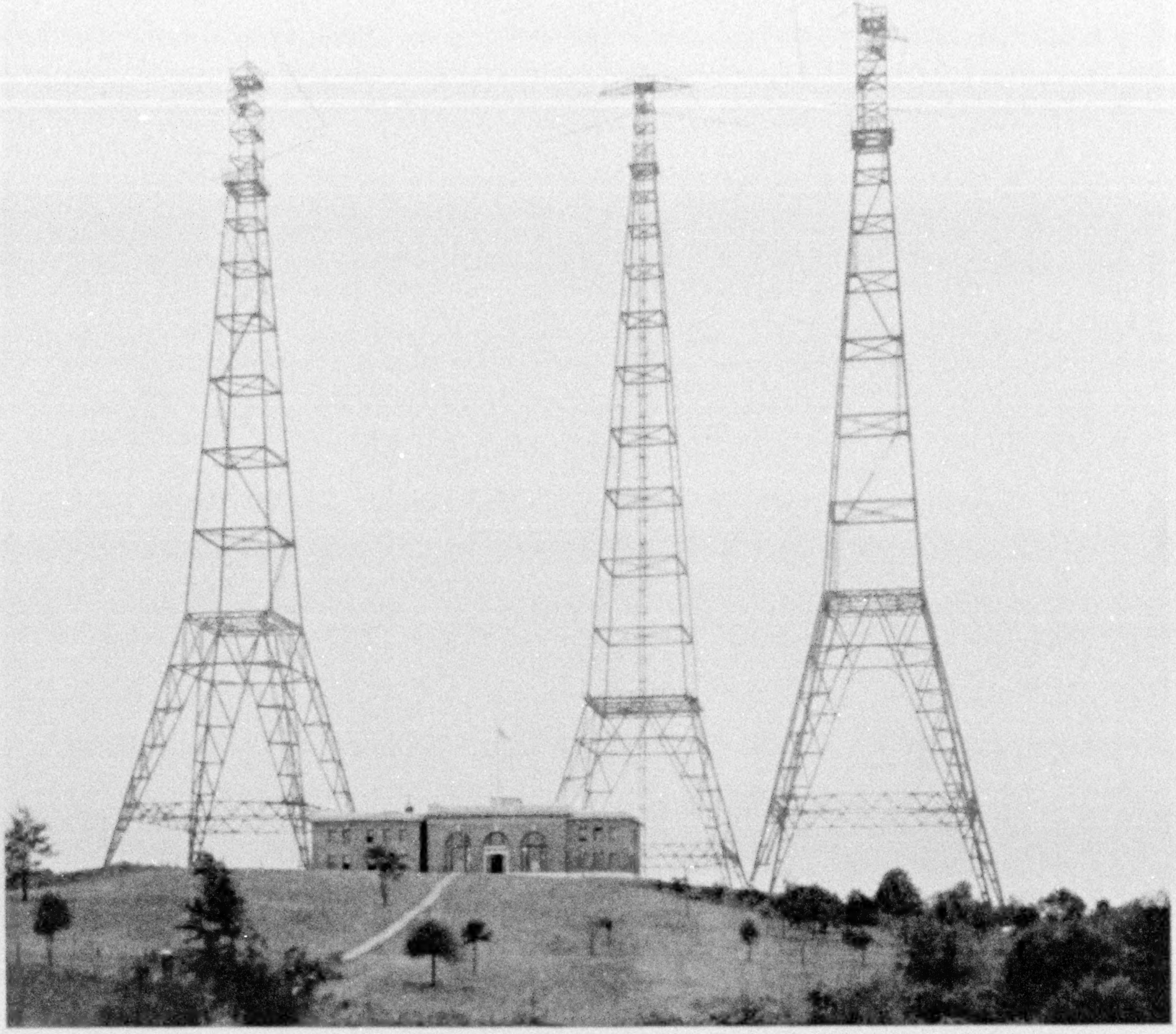
And then came a new series of demonstrations. Up to that time we were talking over wires. The messages were not free to move anywhere but along particular wires to particular places.

Now sounds were to be mounted on steeds of inconceivable fleetness and dispatched through the circumambient to everywhere in general and New York in particular.

* This was not the first time that a youngster had talked across the continent, however, for the very first child's voice flashed through the transcontinental wires was that of Melville Bell Grosvenor, grandson of Dr. Alexander Graham Bell, at the opening of the New York-San Francisco telephone, January 25, 1915.

Little King Harris, aged three, and his brother Lawrence, aged five, in San Francisco, are saying good-night to their father and mother, who, 3,000 miles away, are guests at the National Geographic Society banquet in Washington, D. C. (see page 300). It is 7.30 p. m. in San Francisco and 10.30 p. m. in Washington, D. C.

XUM



Photograph by Harris & Ewing

THE ARLINGTON WIRELESS STATION

It was from these towers that the human voice was heard nearly half way around the earth, when Mr. Espenschied, in Honolulu, overheard Arlington talking to Mr. Shreeve, in Paris (see pages 303 and 314).

When a wireless telephone turns loose a word into space, it does not travel through a lane to the point of destination; rather it spreads itself north, south, east, west, and literally fills the air with sound; so that we might, instead of "Those who have ears, let them hear," now say, "Those who have wireless telephones, let them hear." That is why Honolulu was able to eavesdrop on a conversation between Arlington and Paris. Dr. Bell has surely brought the eavesdroppers into their own when he has made it possible for them to hear in Honolulu what Washington says to Paris.

The first of these demonstrations was the talking over a circuit made up of two sections of wire and one of wireless. The banquet-room was connected by wire with Arlington wireless station. There the messages were transferred to the air. At New York they were picked up again by the wires and brought back to the banquet-hall.

And as people at the far ends of the hall held their receivers to one ear and listened to Mr. Carty and Secretary Lane talk into their telephones, the sound in the receiver seemed the voice, and the sound in the air the echo, so rapidly were the words conveyed on their 450-mile circuit.

THE TELEPHONE BUILDING AT EL PASO, TEXAS, FROM WHICH GENERAL PERSHING TALKED TO THE 800 MEMBERS AND GUESTS OF THE NATIONAL GEOGRAPHIC SOCIETY BANQUET AT WASHINGTON, D. C.

A NATION'S HEART BEAT

But this was not yet the supreme test—the test that brought the guests to their feet with hearts beating fast, souls aflame with patriotism, and minds staggered as wonder had followed wonder as minute followed minute.

Now a screen was stretched across the end of the banquet-hall, a moving-picture machine was wheeled into action, and the Star Spangled Banner flashed its thrilling beauty upon the screen.

Over at Arlington wireless station a phonograph began to play. Out of its vibrant throat leaped a nation's patriotism expressed in song. A wireless transmitter gathered the notes and gave them to the Hertzian waves. The sounds that the phonograph itself released into the air were soon lost. They were as much slower than the wireless impulses they started as a snail is slower than the fastest big-gun projectile.

For nature made sound travel 360 yards a second, while the wireless telephone has given it a speed of 186,000 miles a second. Thus a wireless message envelops the whole earth in the time that a sound in its native element spreads over a circle 144 feet in diameter. Dr. Bell has made the human voice able to travel nearly a million times as fast as it could before he invented the telephone.

It was less than the proverbial twinkling of an eye between the utterance of the sound by the phonograph at Arlington and its receipt in the 800 receivers in the banquet-hall; and as it floated in gently and softly, yet clearly and impressively, its stirring appeal moved every

BUILDING TRANSCONTINENTAL TELEPHONE LINES UNDER DIFFICULTIES

In hauling the heavy redwood poles over the western desert the construction gangs have to build their own roads

soul to song, and the hundreds present joined in our national air:

"And the Star Spangled Banner in triumph shall wave
O'er the land of the free and the home of the brave."

It was an inspiring moment, quickening the pulse, electrifying the mind, and causing waves of enthusiasm to sweep over the banquet-hall as billows over the sea.

It was then that Dr. Bell exclaimed: "We have just been hearing 'The Star Spangled Banner' by wireless and the audience has joined in singing it. It occurs to me that by means of the telephone the millions of people of the United States may soon sing 'The Star Spangled Banner' all at the same time."

And then came the speech-making; but it was a subdued, an overwhelmed, a reverent audience that the speakers addressed. The spirit of mirth and levity had no place among people who had witnessed such marvelous exhibitions.

ADDRESS OF THE TOASTMASTER, HON. FRANKLIN K. LANE, SECRETARY OF THE INTERIOR

I do not know how you feel after the exhibition that has just been given to us, but for myself I can say that I feel humbled and meek and overwhelmed, for no man can say, after the things we have seen, after the things that we have heard, that anything is longer impossible.

They tell me that this is a cynical age—an age that is materialistic and without faith—but, standing in the presence of these miracles, these wonders, I say to you that it is, above all ages, the age of faith.

No man can say that it will not be possible at some future time to talk, as I threatened to talk tonight, to the planet Mars. There is probably not one man or woman here who, forty-five years ago, would have said that it would ever be possible to talk across this continent by wire, much less to talk to New York and back again to this hotel by wireless. This age is not cynical, is not without faith. The motto of this age might very well be the words from Peter Pan. We do believe in fairies. The only difference is that we have changed the kind of fairies that we believe in, and instead of believing in Hop-o'-my-Thumb and Jack of the Beanstalk, we believe in fairies like Marconi and Pasteur and Carty and Graham Bell.

We live in a city that is studded about with statues of men who have made large sacrifices and done great service for our country, statues of our generals, crowned by that wonderful monument that pierces the sky, to the man that led us in our fight for independence; and soon we will add to that the great Greek temple that is to be forever a monument to the man who kept this Union for us.

But where are the statues to the men who have made America? Where are the statues to the men who are the inventors and the engineers and the discoverers of this continent? Out of my office every day go 250 patents. Our people have the greatest resources of any people in the world, not in their soil—although that is without equal; not in their minerals—though no other nations can rival us as to minerals—but in the inventive genius of the American mind, which we honor tonight.

Other countries do honor to men of this class. They may command a knighthood or a baronetcy. We cannot indulge in such luxury, but the National Geographic Society can hold a banquet in honor of such men and crown them with the laurels of our affection and admiration.

THE INGENUITY OF MAN

The men who make this world and the men who serve this world are preëminently the men who work in laboratories and in workshops. The boys across the water may believe that theirs is the real conquest of the world; but it is not so. The world is being conquered by the mind and the ingenuity of man.

In Paris there are two monuments that have always attracted my attention—the Tomb of Napoleon, which every one sees; but behind the dome of the tomb there is a modest statue to Pasteur, a man whose name will be remembered when the names of generals and monarchs and emperors are forgotten, and on the front of that monument there is a picture of a girl, the statue in relief of a girl just rising from her bed, leaning against her

mother, and the mother is looking up in gratitude in Pasteur's face above, while in front of her the figure of Death slinks around the corner of the statue. To such men should our monuments be given, because they are those who conquer this world.

BATTALIONS OF COMMERCE

But it is not for me to talk to you tonight, but to give you an opportunity to see those who have done things. This is a city of almost perennial talk, and it is proper that such an exhibition of the telephone should be given here. But it is not often that we have an opportunity to see those men who have throughout half a century given their genius to our country and made it distinct on the face of the earth. One of the rarest qualities in man is the genius for organization, and I want to present to you a man who has under his direction tonight 250,000 men and women—the man who came from a department of this government forty years ago, and who has organized the greatest telephone system in all the world—Mr. Theodore N. Vail.

ADDRESS OF MR. THEODORE N. VAIL, PRESIDENT OF THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY

This splendid compliment to "telephony" and to those identified with it, coming as it does on the official birthday of the telephone, is most highly appreciated by us all, and recalls to me many points of mutuality.

The home of the Society is in the beautiful "Hubbard Memorial." Mr. Gardiner G. Hubbard, the father of the telephone business, was the sponsor and father-in-law of Dr. Bell, inventor of the telephone, was one of the godfathers of this great Society, and grandfather-in-law of Gilbert H. Grosvenor, the man who has done so great a work in the development of the Society and of its Magazine, devoted to the spreading of geographical information. The part taken by Mr. Hubbard in laying the foundation of the existing telephone business, in opening up the vista through which we could all see its future, and the contributions made by him to the general business policy which has had so essential a part in the greatness of the business can never be overstated.

As general superintendent of the railway mail service, I was brought into intimate personal contact with Mr. Hubbard, who was the chairman of a commission created by Congress to investigate and report upon the then aspects of the always-with-us controversies over the compensation of the railroads for transporting the mails. Congress had recently made a horizontal reduction. On the trips of the commission over the country Mr. Hubbard carried with him a few telephones, and without neglecting the work of the commission, he at every opportunity exhibited and explained this marvelous invention. We discussed the business, its possibilities and potentialities, and the policies which should underlie its development, so that my connection with the telephone may be said to date from its inception.

THE GLORIOUS CAREER OF AN UGLY DUCKLING

The apparatus was extremely crude and very unsatisfactory. A child never was born with less apparent promise of the destiny it has attained. Yet there never has been a discovery or an invention that in the short life of forty years has so revolutionized that with which it has had to do (see page 310).

The four associates—Bell, Hubbard, Sanders, and Watson—who were behind the telephone, under the leadership of Mr. Hubbard, started the business in 1877. The first corporations which brought capital and organization to practically and systematically exploit the business were formed in 1878.

To look back on those days, it seems as if they had covered ages; yet it was but three years, from 1876, the natal year of the telephone, to 1879, the year in which the settlement with the Western Union was made, and the first big hill in the life journey of the telephone was crossed. At least two of these three years were employed in teaching the telephone itself how to talk intelligently and satisfactorily; for not until 1878

THE NEW WAY IN TELEPHONE LINE CONSTRUCTION

Motor trucks are used to haul a derrick from hole to hole, and four men can do the work that formerly required a dozen. The Bell Telephone System has spent twice as much money in the same length of time (1906-1914) for the extension of the telephone service of the United States as the United States government has spent for the construction of the Panama Canal (see page 322).

XUM

Photograph by George J. Hare

A TELEPHONE BUILDING IN BUFFALO, NEW YORK

It is in such modern structures as this that the great "union stations" of the telephone world are found. Trains of electric impulses are dispatched to all parts of the continent from them. "New York City alone, exclusive of its suburbs, has twice as many telephones as the whole of France, nearly one-half as many as the German Empire, and quite as many as the whole of Spain, Portugal, Switzerland, Italy, Greece, the Balkan States, Turkey, and Russia combined" (see page 321).

was a practical, commercial, dependable, usable instrument developed.

From the settlement with the Western Union the history of the business is well known; its progress is familiar to you all, and this evening you have had a demonstration of what can now be done and indications of future possibilities.

THE BATTLE OF DAVID AND GOLIATH

The most important single event in the history of the telephone business may be of interest.

The telephone patents had been offered to the Western Union, but the offer was declined. Through the Gold and Stock Telegraph Company, the Western Union was doing a profitable local private-line business, using printing telegraph instruments. The first development of the telephone was for use on private lines, replacing the printing instruments. When the Western Union realized this, to protect its business, it entered the telephone business in competition with the Bell, operating under various patents which it claimed were independent of the Bell patents.

The Bell interests were devoting their energies to developing telephone-exchange business. The Western Union, through its prestige and power, had for a little while a seeming advantage. The fight was a David and Goliath affair. The Western Union was the largest and most powerful corporation of the time—relatively greater than anything that exists today.

Eventually a compromise was proposed. The Western Union believed the great future of the telephone to be in private-line use; the Bell believed it to be in the exchange service, which is in fact a system of private lines from the central office to each subscriber. By means of switchboard and trunk lines any subscriber's private line can be connected with any other subscriber's private line, constituting a private line from subscriber to subscriber.

The negotiations hung on the condition denying to the Bell interests the right to connect their exchanges by means of toll lines. Few had faith in the future of the toll lines or their value as compared with the private lines, but if long-distance conversation should be developed the Western Union feared it might be a menace to the telegraph business. Time has demonstrated that the telephone can never be substituted for the telegraph instrument; that the long-distance telephone is not competitive with telegraphy, but has a distinct field of its own; that the telephone system is supplementary to, not competitive with, the telegraph system.

The prospects for the future of toll lines or distant speaking—the idea of carrying the voice any great distance—met with little serious consideration, and the idea of speaking across continents met with ridicule. Our engineers, at a considerably later period, thought it might be possible to talk to Chicago, if we had a big enough wire; but the bigness was prohibitive.

The conferees of the Bell were divided about the toll business; some of them tired of the contest, preferred half a loaf in peace and comfort, rather than a struggle for a whole loaf; if yielding would bring about a settlement, some were willing to yield. To me the idea of yielding the toll-line use meant the curtailment of our future, the absolute interdiction of anything like a "system."

At the end of a nearly all-night session on one of the Sound boats en route for New York, we had a unanimous committee, who determined the Bell should retain the exclusive and unlimited right to telephones for exchange service with a 15-mile radius, and for conversational purposes, any distance, but willing to yield to the Western Union the exclusive right to the telegraph business and to private lines. On this the Bell stood, except that the private-line right was made non-exclusive, and the settlement made on these lines determined the basis for the telephone development.

THE REWARD OF RESEARCH

The present development of the telephone is not due to disunited effort, although many and valuable suggestions and inventions have been either concurrently or independently developed outside the Bell system. It is due to the centralized, coöperative coördinated work of the

departments of operation with the departments of engineering, experiment, research, and development—of the whole Bell system. Research, investigation, experiment, comprehensive and thorough, are now necessary to hold any position in any industrial or utility enterprise, and those on a large, comprehensive scale are enormously expensive.

This centralization has produced a high and most completely developed system; beyond every point that has been reached there have always been possibilities of something greater, and these possibilities have been the goal of every one connected with the business.

It is a unique coincidence that the two epoch-making inventions which created the art of electrical transmission of intelligence were made by men absolutely outside the field of electricity. Professor Morse was an artist. From his reading of Professor Henry's discovery of the magnet and the possibility of controlling its action from a distance, he conceived the idea of transmitting combinations of signals, to be interpreted into figures, letters, words, sentences. He had no scientific or mechanical education or training and little money. He found in Alfred Vail an assistant, one who had a scientific education, mechanical training, skill, and ingenuity, who had a father with common-sense enough to believe in the idea, money and courage enough to finance it.

ONLY ONE MAN ON THE RIGHT TRACK

There were many working on the multiple telegraph, but from different standpoints and for different purposes—among them Professor Bell. He had in Watson a trained mechanic, and in Hubbard and Sanders believers and capitalists. Bell was not an electrician, but was trained in articulation and the science of speech. His powers of observation, and particularly of perception and deduction, were great. In his telegraph studies and experiments he observed some phenomena from which he evolved the idea of the telephone, and when he recognized in the vibrations of the reed the peculiar timber of vocal speech he knew he had the solution.

There was no one working on the speaking telephone, except Professor Bell, who could have invented it. They were approaching the subject from the standpoint of electricity without the knowledge of acoustics or the requirements of speech production, or the character of vocal vibrations, of which Bell was the master. This knowledge was the key to the invention.

It was so simple that all wondered at it, and so seemingly impossible that all ridiculed it; but so soon as it became of utility many claimed, copied, and pirated it.

There was not and never has there been any telephone made which is not based on Bell's patent, and, with the exception of what Berliner contributed, his invention contained all that is essential in the instrument in use today; and yet the only time when Bell was the undisputed inventor of the telephone and the Bell Company without opposition was during the year 1876, before its commercial value was recognized, although every one acknowledged its scientific importance.

GEOGRAPHY AND THE HUMAN VOICE

The Geographic Society has a symbolic picture with the inscription, "The Geographic brings all the world to you." It might be said that the telegraph brings all the world into immediate communication, and the telephone fetches your voice and conversation to the world.

Geography establishes position and determines distances; discovers the potentialities of the world and reveals the paths of intercommunication.

Geography may be termed the anatomy, transportation the veinous or arterial system, and telephony and telegraphy the nervous system of the world and its economic and social structure.

Intercommunication, of which the telephone is the latest exponent, binds this world together, draws its interests closer, and will in time create a condition wherein all interests will be common to all people.

Common interests, patriotism — the bases of all communities, commonwealths, or nations—can only permanently exist where there is common language. Natural and permanent boundaries of nations are so established.

Photograph by M. Rosenfeld

MANHOLE WITH CABLES READY FOR SPLICING

These huge cables are each made up of thousands of insulated wires sheathed in lead and carried into the telephone exchanges. The largest cables used contain 2,400 individual wires.

Geographic science is fast revealing the world and its possibilities and potentialities; intercommunication is fast utilizing these discoveries and making necessary to all people common language or common understanding of languages, and when that common understanding comes, which is bound to come with free exchange of thought and ideas, then will come a common brotherhood.

GEOGRAPHY DISSIPATES SUPERSTITION

It will take time to overcome the force of inertia which binds the man to the inherent, inherited, inbred ideas, traditions, prejudices, habits, conventionalities, which endure through generations and are overcome only by new experiences, new knowledge. Some term this conservatism, but it is nothing but the inertia that comes from lack of a new knowledge vivified by new experiences.

Geography reveals the world and makes it real; it dissipates the haze and fog of superstition and tradition, attracts and encourages the travel which brings expansion. In this vast field there is abundant room for practical, constructive imagination to work. The immediate future is only dimly outlined by the light of past experience and present knowledge; the distant future is still in the shadowy haze of uncertainty, speculation and doubt; but, though it may be too optimistic and too hopeful, there seems to me no doubt but that progress in the future will be as marked as in the past.

There can be but few great developments in the future of which the beginnings have not been made or have not been foreshadowed. Each age has believed it had reached the acme of evolution in economical, commercial, and artistic lines, and that but little more was possible. In "transportation" the newly introduced stagecoach of the eighteenth century gave way to the steam railroad expresses of the nineteenth century; and electrical and aërial transportation are dawning in the twentieth. In "intercommunication" the signal lights of the Middle Ages gave way to the semaphore of the eighteenth century—the electric telegraph of the early, supplemented by the telephone in the late, nineteenth century. And in the twentieth comes the dawn of transcontinental, transoceanic, and circum-mundane electrical intercommunication and conversation!

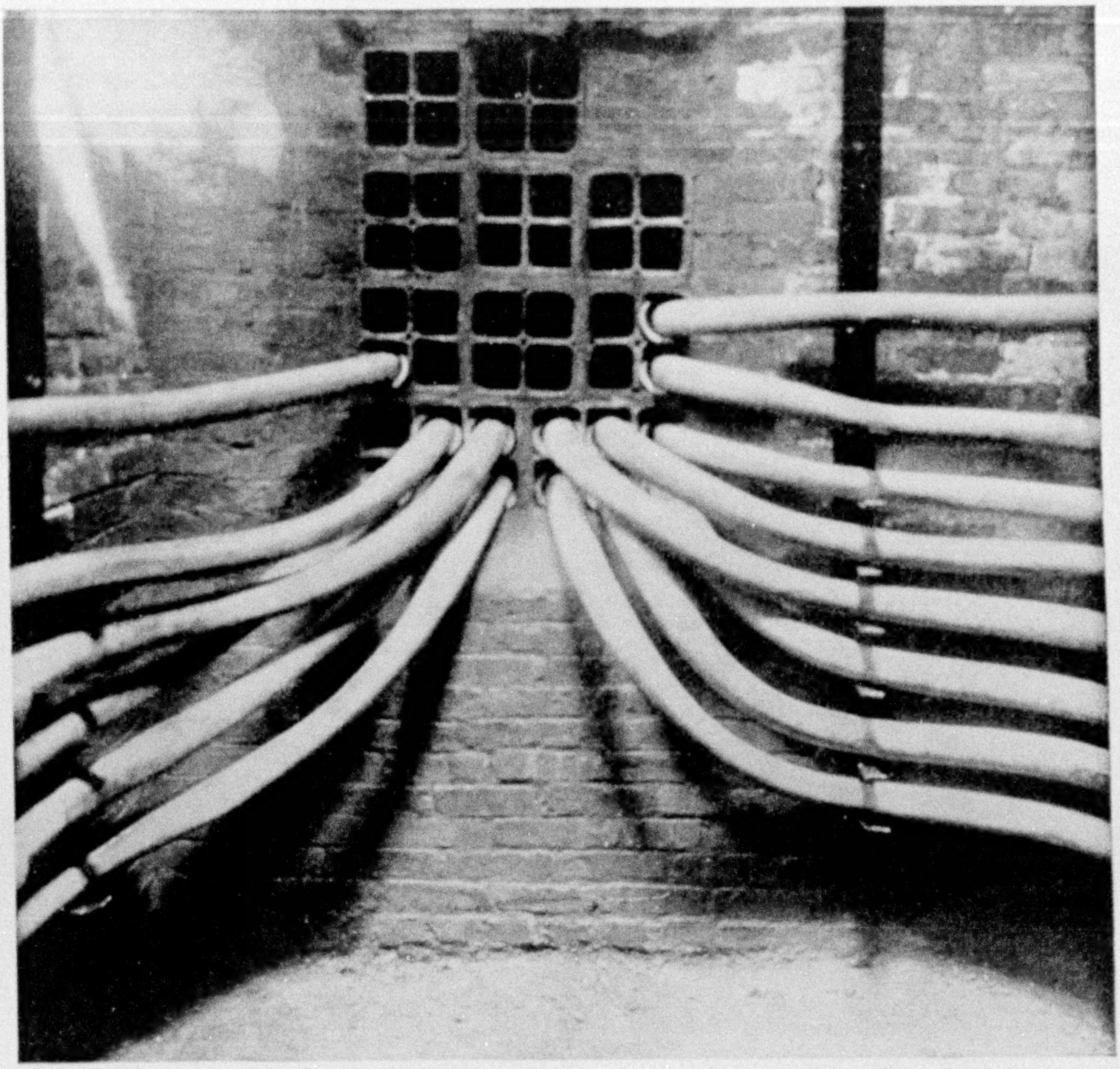
When Mr. Bell and Mr. Watson first talked in public over the telephone, or Mr. Hubbard first tried to interest constructive interests in the new "Yankee toy," if either had prophesied as possible what actually exists today, he would have been laughed at. Those who laid the foundation of the business could well define the structure, but its magnitude has far surpassed expectation. When my connection with the telephone was announced, one who was then a Representative and afterward a Senator and a Cabinet Minister, whose name always commands respect, said to me: "Vail, that isn't a big enough business for you." Consider that in the light of today!

SOME DAY WE WILL BE ABLE TO TELEPHONE TO EVERY PART OF THE WORLD

Is it too much to think that in time it will be possible for any one, at any place, to immediately communicate with any one at any other place in the world by reasonably available methods; that distance will be annihilated and the whole world will be united in common interests, common thought, common traditions, and prejudices? Then and only then can there be a common people.

The wonderful work that geographical research did in opening up the unknown world in the late seventeenth, eighteenth, and early nineteenth centuries presented a new field to the people of initiative and enterprise, of an Old World already bursting its confines by its overdevelopment.

This world development, for which geographic research is largely responsible, is in turn responsible for the magnitude of present operations, economic and social. This immensity is constructive, not destructive; is something to be welcomed and encouraged rather than persecuted and destroyed. It is something



THE MAIN LINES OF THE VOICE RAILWAY WORLD (SEE ALSO PAGE 311)

which is uplifting all men, raising them up to higher levels and possibilities, and is neither oppressing nor taking away from man any possibility of greater enjoyment or of better things. It is bringing to him and within his power of acquisition those things which were formerly for the few. It is making possible all things that can bring the extremes of mankind nearer together.

A WORLD-WIDE BENEFIT

This economic industrial development of the world is caused by that coöperation, that coördination of effort which assigns to individuals the tasks and duties for which each is best fitted, and in this way gets the most out of the efforts of all. It will not, nor can anything ever make any one independent of individual effort or raise any one above his inherent possibilities.

This development is so infinitely greater than that of the past, and has come so much faster than the minds of men could possibly become adjusted to it, that there has been no standard familiar to man's mind by which to measure it. The abuses which always accompany any movement, great or small, are looked upon as integral elements of them, not merely incidental. These misunderstandings, the inclination to introduce repressive and corrective measures, where only directive measures are wanted, are caused by the *vis inertia* of men's minds and the im-

XUM

Photograph by M. Rosenfeld

CHELSEA TELEPHONE EXCHANGE: NEW YORK CITY

A hundred dispatchers here handle the thousands of trains of talk that hourly pass through the big terminal. "Is it too much to think that in time it will be possible for any one, at any place, to immediately communicate with any one at any other place in the world by reasonably available methods; that distance will be annihilated and the whole world will be united in common interests, common thought, common traditions, and prejudices? Then and only then can there be a common people" (see page 312).

possibility of adjustment to the rapidity and immensity of the development.

When the true understanding comes, all will unite in directing and guiding and protecting; then and only then shall we reap the full benefits of man's developing powers and understanding and of man's initiative and enterprise.

ADDRESS OF DR. ALEXANDER GRAHAM BELL

I am really overwhelmed by the realization of the greatness of the demonstration that has been given us tonight. Wonderful! Wonderful! It brings back to mind the significance of the first message ever sent by the Morse telegraph, "What hath God wrought!"

I am overwhelmed in more ways than one. I do not see what I have had to do with this thing. Many, many minds have contributed to the development of the telephone of today, an army of workers organized under Mr. Vail and Mr. Carty, and the researches of the telephone and telegraph company have been required in order to bring these marvelous results.

When I try to find out what I have done and look back to the long vista of years, I see only this (*holding aloft the first telephone instrument which demonstrated the possibilities of transmitting the voice by electricity*), the original Bell telephone, Mr. Watson and myself working hard at it to make it speak. It was a most disappointing introduction to this wonderful art. Mr. Watson could always hear a great deal better than I could. He could hear phone speech sounds and occasional words, and I tell you it was a great day, on the 10th day of March, 1876, when at last there was no doubt about it; complete words and sentences were understood both by Mr. Watson and myself. I can remember very well talking into the instrument, which was connected with the next room, and said: "Mr. Watson, come here, I want to see you." And he instantly came into the room, and I was delighted to know that he had understood.

It was only a short time ago that I was talking from New York to San Francisco—Mr. Watson in San Francisco and I in New York—and I was asked to repeat the same sentence which was the first to be transmitted over and through this instrument itself, and I put my mouth to this old telephone in New York and called out to Watson in San Francisco: "Mr. Watson, come here, I want you." He replied: "It would take me a week to get there now" (see page 298).

Now I cannot claim very much credit for all this wonderful development. I can see this whole telephone away in the distance and extending from it an army of workers laying wires and extending the influence of the telephone, headed at first by the first President of the National Geographic Society, Mr. Gardiner Greene Hubbard. Then, as this army of workers extended to this great general, Mr. Vail, who has brought the telephone system in America to completion.

DREAMS THAT CAME TRUE

Away back in the old days I dreamed of wires extending all over the country and of people in one part of America talking to people in another part of America. It was the dream of a dreamer, but Mr. Vail has made it come true, and today we have been witnesses of the fact that there is no part of this continent that is inaccessible to the human voice. Mr. Vail has brought this instrument into every home. What would business be without it? It has even gone into warfare and into the trenches in Europe; in fact, Mr. Vail is evidently trying to make the telephone "First in war, first in peace, and first in the hearts of his countrymen." He has covered this continent with a network of wires, millions of miles in extent; he has accomplished the dream of my youth of the wires that should cover this land.

But our good guest of the evening, Mr. Carty, is going further than this and he is getting out all the wires. It was only a few weeks ago that Mr. Carty and his associates demonstrated the possibility of wireless telephony by talking from Arlington here to the Eiffel Tower in France, and a man in Honolulu overheard the conversation.

Where are wonders going to cease? Why, that is a distance equal to one-third of the circumference of the globe. Is there any part of the globe that Mr. Carty

may not reach by telephone and without wires at all?

I am struck to the heart to meet my old friend, Mr. Vail, for we have not met since we were young men, and we are not so very old now. Yet we look forward to see what Mr. Carty and his brilliant associates of the American Telephone and Telegraph Company will bring forth in the future.

ADDRESS OF MR. JOHN J. CARTY, CHIEF ENGINEER AMERICAN TELEPHONE AND TELEGRAPH COMPANY

There are many who are yet to speak to us, and as I have already spoken so many times this evening and to so many places, I must be brief in what I have to say now.

These demonstrations in which you have all taken part tonight are not the result of the work of any one man; they are made possible by a long line of investigators, beginning with Dr. Bell himself. For my own part, I am fortunate in being the chief of the large staff of engineers and scientists which has put into practical form and placed at the service of the public these marvelous developments which have been exhibited before us tonight.

Some of these men, I am glad to say, are present with us. There is Mr. Shreeve, who, at the Eiffel Tower, heard the first words spoken across the Atlantic. Mr. Espenschied, who was stationed at Honolulu and heard Arlington talking to Mr. Shreeve at Paris, is on duty tonight at the Arlington Tower, where you all heard his voice speaking to me. Then there are Mr. Gherardi, Mr. Jewett, Mr. Mills, Mr. Drake, Mr. Thompson, Mr. Blackwell, Mr. Robinson, Mr. Arnold, Mr. Colpitts, Mr. Campbell, Mr. Heising, and Mr. England.

TELEPHONY IS AN AMERICAN ART

These young men all illustrate very well the character and make-up of the staff. They are all from American colleges and universities; some of them trained under Dr. Pupin, whose classic invention, the loading coil, is employed in the San Francisco line. One of these young men is a graduate of the University of North Dakota and another is a graduate of the University of South Dakota, and each has taken his postgraduate studies in another university. Instead of going to Germany, France, or England, which was formerly necessary for such advanced work, they did not have to go any farther east from the Dakotas than to the University of Michigan and the University of Chicago, where they received postgraduate scientific training equal to what they could get in the best European universities.

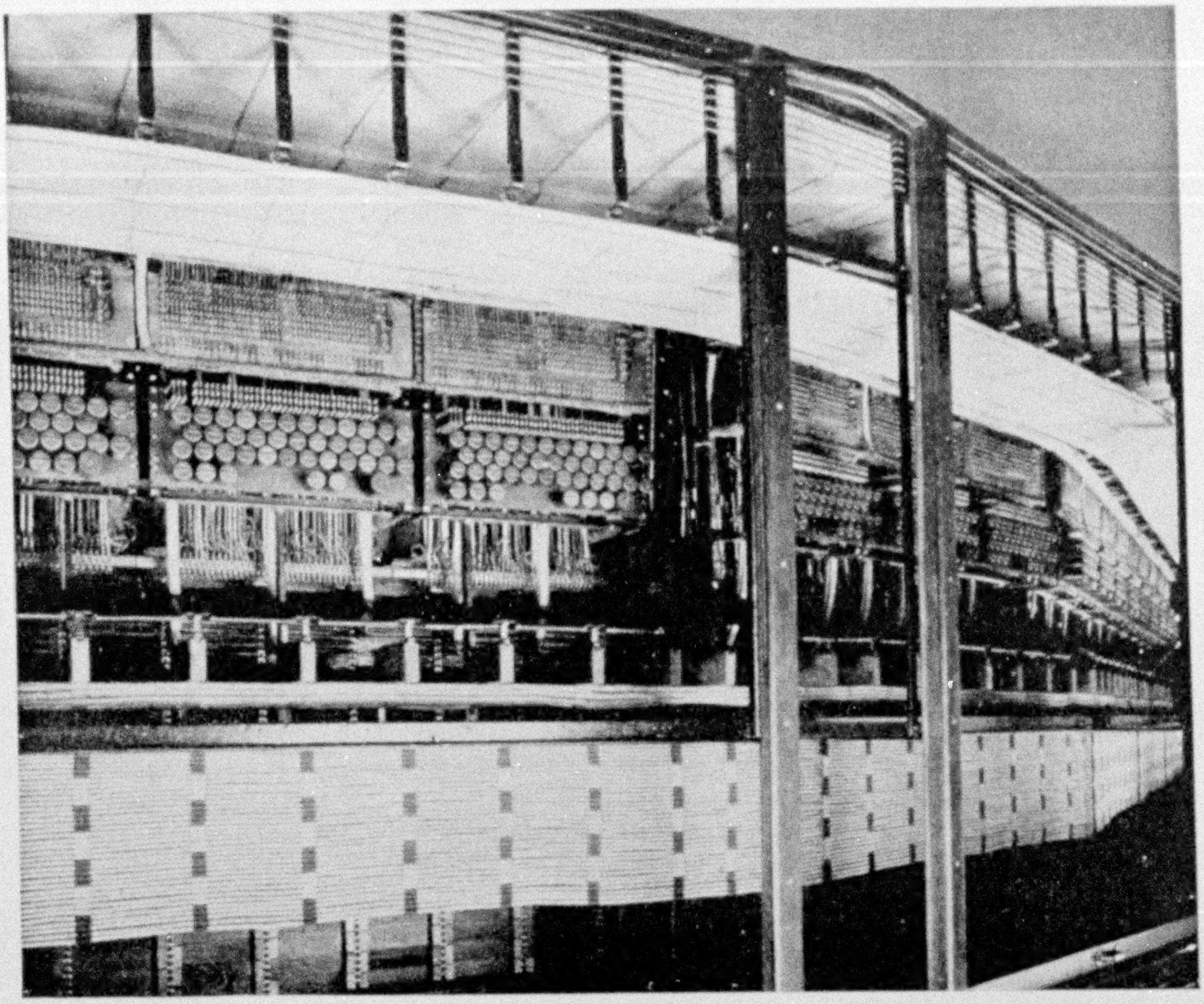
It is a most interesting and encouraging sign of American scientific development that two of these young men are from universities in North and South Dakota, States which were inhabited largely by savages at the time when General Scott was on the frontier conducting Indian warfare. There was a time when it was necessary for us to go abroad to study the arts, but in respect to one art at least the tide has turned, for in order to study the art of telephony it has long been recognized by the nations abroad that their engineers must go to America, the home of the telephone.

This splendid recognition which the National Geographic Society has accorded to American telephone achievement will be received with feelings of deep appreciation by American telephone engineers; and, speaking on their behalf, I can assure you that in the future, as we have always done in the past, we will in all things pertaining to the art of telephony keep secure for our country the foremost place in the world.

ADDRESS OF HON. THOMAS WATSON, OF BOSTON

I am very proud and glad that I was chosen by the fates to be the associate of Alexander Graham Bell in all the experiments by which the telephone was perfected.

To tell you one-half of what Dr. Bell did during the three years I was associated with him would take me the rest of the night, so I cannot do it. However, I want to describe the one incident which was very important in the history of the telephone, the night when Dr. Bell and I talked over a real outdoor telephone wire



THE REAR VIEW OF PART OF THE SWITCHBOARD SHOWN ON PAGE 314

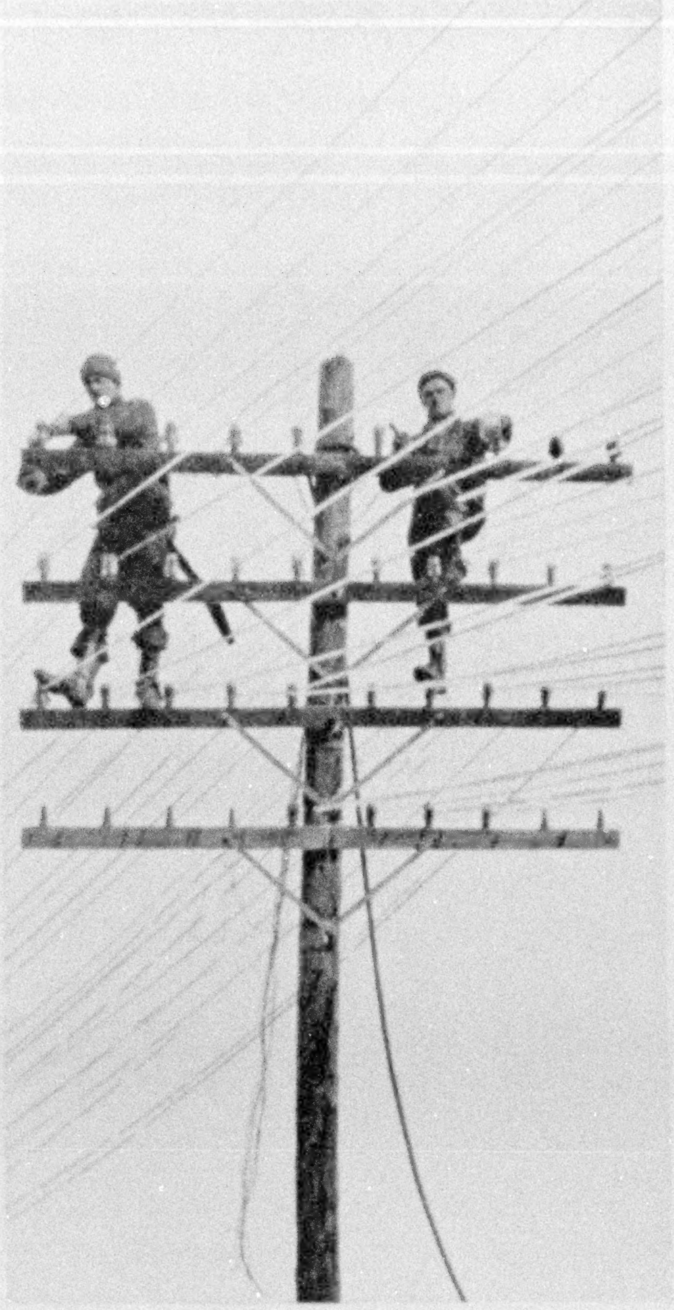
"The two States of New York and Pennsylvania have as many telephones as the whole of Great Britain, France, Belgium, Italy, Serbia, and Russia combined, while Ohio and Illinois have as many as Germany, Austria-Hungary, Bulgaria, and Turkey combined" (see page 321).

for the first time. I made with my own hands for Dr. Bell, under his direction, the first speaking telephone the world has ever seen, but there were 16 months' hard work after that before Dr. Bell thought his baby was big enough and strong enough to talk outdoors.

On the 9th day of October, 1876, a very important day in the history of the telephone, Dr. Bell had obtained permission to use a wire running from Boston to Cambridge, about 3 miles long, and on that evening I went out with one of the best telephones that had been devised up to that date, and Dr. Bell proceeded to Boston with its duplicate. I waited out at the Cambridge factory until Dr. Bell signaled on the telegraph instrument that he was ready. I think I was then more excited than I ever was before in my life, or ever have been since, and I connected up the telephone to listen to what Dr. Bell would say, and I could not hear the faintest sound.

I shouted back in the telephone and listened again, and there was nothing but the blackest, dreadful silence. I knew that we were working against the most delicate electrical current that had ever been used for any practical purpose, and as I could not hear his voice I thought that the delicate current must have leaked off of every insulator so that none of it got across the Charles River to where I was.

I had almost made up my mind to disconnect the telephone and telegraph back to Dr. Bell that while his telephone might do very well for speaking tubes, it never would compete with the telegraph. Then



REPAIRING THE DAMAGE DONE BY SNOW AND SLEET

I happened to think that there might be another telegraph instrument connected in the circuit in some other part of the factory that I was in.

The janitor had been standing there looking at me as if he thought I was crazy, shouting into the end of the wire and expecting somebody in Boston to hear me. I asked him to show me where the wire entered the building and he did so. I traced it through the building and found another telegraph relay in the same circuit. My heart gave another jump, for I realized that there was another chance. I got it out, rushed back to the telephone, and listened.

That was the sole cause of the trouble; far louder and more distinct than I ever heard it before, Dr. Bell's voice was coming out of that instrument, and he was saying: "Watson, are you there? Are you listening? What is the matter?" I shouted back, and then ensued the first conversation that ever has been held over a real telegraph wire.

Some of Dr. Bell's pessimistic friends had been objecting and saying that the telephone would never compete with the telegraph business even if he did get it to talk over an outdoor wire; so he made an arrangement with me and I went to Cambridge, and everything I heard him say through the telephone I wrote down, and what I said to him he would write down at his end of the wire, so that the record could be put side by side to prove to the croakers that the telephone could really transmit intelligence accurately. That was done; so that first conversation was preserved, word for word.

After he finished making the record, which perhaps took a couple of hours, we were so fascinated with the joy of talking over a real telegraph line that we kept up our conversation, without recording it, until the small hours of the morning, and I can assure you, ladies and gentlemen, it was a very happy boy who wended his way back to Boston early the next morning with a telephone under his arm, wrapped up in a newspaper.

A LANDLADY WHO COULD NOT APPRECIATE SCIENCE

Dr. Bell was not at the laboratory when I got there, for he had gone to the newspaper office to tell them about the wonderful occurrence of the evening; but when he came in, so enthused and jubilant, we really danced a war-dance. When Dr. Bell used to celebrate he would do so with a war-dance, and I really got so that I could war-dance nearly as well as he. That night we had a jubilee and a war-dance that lasted for some time, and when our landlady met me the next morning on the stairs she made the remark that if we did not stop making so much noise in the rooms of nights we would have to vacate. Our landlady was not at all scientific in her tastes, and I think I remember we were a little behind in our rent.

That was the beginning of this stupendous thing we call the Bell system today, and it almost takes my breath away

to see what it has passed through. I have been out of the telephone service for 30 years, but I say it almost takes my breath to see what has been done in the years that I have been away from it; and when I think of the men in charge of this—Mr. Vail in charge of the business organization and Mr. Carty and his associates following up the technical scientific part of it—I must say that I have found boundless hopes for the future, and I can only ask in amazement what they will next do. I thank you.

ADDRESS OF UNION NOBLE BETHELL, SENIOR VICE-PRESIDENT OF THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY

While I am in entire accord with Mr. Carty in his characterization of the telephone art as an American art, when he was talking I could not but think of something which is said to have happened recently in the capital city of Pennsylvania. A number of citizens of that great Commonwealth were gathered together, and were congratulating themselves upon the greatness of their State and the number of its sons who had attained prominence throughout the nation and throughout the world. At length one of the number said to his brethren: "Gentlemen, I desire to propose a toast to that greatest of Pennsylvanians, Benjamin Franklin, of Massachusetts."

A FITTING TOAST

So I think it entirely proper and fitting for us on this occasion to extend our congratulations and felicitations to the foremost figure in the creation of this American art, that distinguished American, Dr. Graham Bell, of Scotland.

We all know, though, that Dr. Bell is an American as much as any Pilgrim Father ever was. Americans of his type, who could not control the accident of birth, have helped to transform a wilderness into sovereign States, and to create great industries, important cities, vast empires, and all that sort of thing. They are proud of America and America is proud of them.

In this age of achievement and efficiency it is very difficult for us to realize the significance of what we have seen and heard tonight. We are so apt to take things as a matter of course. It is only by contrast that we can get a right perspective and form true conceptions.

WHERE TELEPHONES WOULD HAVE AVERTED A GREAT BATTLE

When Cornwallis surrendered his sword to Washington, a swift ship—mark you, a *swift* ship—was dispatched to England to carry the news. It was bad news, and we all know that bad news travels fast. Yet 37 days elapsed before George III knew that he had lost some colonies and gained some cousins.

At the close of the succeeding war, that of 1812, the transportation of news was still so slow that the battle of New Orleans, the bloodiest battle of that war or the preceding war, was fought fully two weeks after the treaty of peace was signed at Ghent, and some time later the news of the conclusion of peace and of Jackson's victory reached the city of Washington about the same time.

In 1843, when the Oregon bill was under discussion in the United States Senate, leading Senators declared that we could never have any interest in a country so remote as that with which we have been conversing so easily and familiarly this evening. "Why," declared one Senator, "it would require ten months for the representative of that far-away land to come to the National Capital and get back home again. We can never have any interest in a country so remote, so difficult to reach, and so difficult to communicate with." But in the very next year there came across the wires those thrilling words, "What hath God wrought!"

The art of transmitting intelligence by electricity was born—a new era was begun. A network of wires soon spread over the land and cables were laid across the Atlantic.

Still, only places, not people, were joined together.

After a time those very practical, commonplace words, "Mr. Watson, come here; I want you," faintly came across the electric wires. That great boon—the telephone—was now given to mankind. Then there began that tremendous development and wide expansion which culminated in 1915, when the human

voice was thrown across the continent and across the seas. And tonight the strains of the "Star Spangled Banner," borne on ethereal wings, are on their way to countless havens throughout the universe.

FORECASTING THE FUTURE FORTY YEARS AGO

I hold in my hand a wonderful document. It is not a speech, only a prospectus. I should like to read it all, but there is time for only a small part of it. It is dated away back 38 years ago. A young man, then at Kensington, England, was asked to say something about the future—the *future*—of the telephone, and he prepared a most remarkable paper. I wish I had time to quote it at length, word for word, but, realizing that the hour is late, I shall give you only a small part of it, and even that not in his exact words. He says: "It is conceivable that cables of telephone wires could be laid underground or suspended overhead, connecting up by branch wires private dwellings, country houses, shops, manufacturing establishments, etc., and also connecting cities and towns and various places throughout the country." He says further: "I am aware that such ideas may appear to you Utopian and out of place, but, believing as I do that such a scheme will be the ultimate result of the introduction of the telephone to the public, I impress upon you the advisability of keeping this end in view that all present arrangements may be ultimately realized in *this grand system.*" Then he goes on with further details, and finally says: "Although there is a great field for the telephone in the immediate present, I believe there is still greater in the future. By bearing in mind the great object to be ultimately achieved, I believe that the telephone company cannot only build up a remunerative business, but also *benefit the public in a way that has never previously been attempted.*"

A document like this, if written in earlier years, dealing with subsequent events of general human interest, would have entitled its writer, when its predictions had become realities, to a place among the prophets.

This remarkable paper closes in this way:

"I am, gentlemen, your obedient servant,

"ALEXANDER GRAHAM BELL."

As the telephone art is an American art, so the telephone habit is an American habit. A few days ago I asked one of our young men to give me a few statistics. I thought that an occasion like this would not be complete without some statistics; but I asked the young man for statistics without figures, and this is what he has given me:

STATISTICS WITHOUT FIGURES

The two States of New York and Pennsylvania have as many telephones as the whole of Great Britain, France, Belgium, Italy, Serbia, and Russia combined, while Ohio and Illinois have as many as Germany, Austria-Hungary, Bulgaria, and Turkey combined.

This cautious young man puts in this note: "This alignment of States is for comparative purposes only, and is not intended to have any other significance."

The city of Chicago, with substantially the same population as Paris, has four times as many telephones as the French capital.

Boston and its suburbs, with about one-third of the population of Berlin and Vienna combined, have as many as both of these European capitals.

San Francisco, with substantially the same population, has eight times as many telephones as Edinburgh, while Washington, with only two-thirds of the population of Edinburgh, has more than three times as many telephones as the Scottish capital.

Here the young man inserts this note: "Apologies to Dr. Bell. Edinburgh still maintains its claim to the honor of being his birthplace. Let Edinburgh beware!"

New York City and its immediate suburbs have as many telephones as London, Brussels, Paris, Petrograd, Rome, Belgrade, Tokio, Berlin, Vienna, Budapest, Sofia, and Constantinople all combined.

NOTE.—"Here there is no indication of anything but the strictest neutrality. The comparison is between New York

Photograph by M. Rosenfeld

AN AFTER-THE-STORM SCENE ON A GREAT VOICE HIGHWAY NEAR YONKERS, NEW YORK

and its suburbs and all the capitals of all the warring nations, including Japan."

New York City alone, exclusive of its suburbs, has twice as many telephones as the whole of France, nearly one-half as many as the German Empire, and quite as many as the whole of Spain, Portugal, Switzerland, Italy, Greece, the Balkan States, Turkey, and Russia combined.

General note: The European statistics used are those of 1914, immediately prior to the outbreak of the war, when the figures, both as to telephones and population, were probably somewhat higher than they are today.

EXPENDITURES TWICE AS LARGE AS AT PANAMA

The statement closes with this item: The amount of money spent by the Bell Telephone System in construction work alone from 1906 to 1914—the period occupied in the construction of the Panama Canal—was more than twice as much as the amount spent by the United States government during the same period in the construction of the canal, exclusive of the amounts paid to the French Company and to the Republic of Panama.

In conclusion, I want to say for the multitude of people in this vast organiza-

tion that we have a wholesome respect for our trade. We like to think of it as a high and noble calling. We like to think that our army of men and women is doing a good work, making the world better, advancing civilization. It is a most exacting work, so exacting that at times we feel like the prisoner of Zenda, whose watchful guards never let him fall asleep, even for a moment.

Though exacting, it is fascinating—fascinating because each one of us sees the relation of his individual work to the work of every other one in the system and the essential relation of the whole to all other activities which, together with it, make up the work of the great pulsating world.

Last—and this is the end—it is satisfying. It is satisfying because through it all there is the spirit of service, than which there is nothing more inspiring and uplifting, because it is manifestly and preëminently of distinct and definite value to mankind, a factor in the advancement of civilization—breaking down the barriers of local prejudice everywhere and spreading mutual understanding, peace, and brotherhood throughout the world.

ADDRESS OF HON. JOSEPHUS DANIELS, SECRETARY OF THE NAVY

While we live in a day when there are some things yet to be righted in the world and some problems yet to solve, it is nevertheless a privilege of men of this generation that we live at a time when the dreams of poets, seers, and prophets have been translated into realities.

The finest things in the world are dreams. "Where no vision is the people perish," wrote one of the old seers, and another, whose vision seemed to overleap centuries and even millenniums and focus itself upon our own times, said: "Many shall run to and fro, and knowledge shall be increased."

It is indeed wonderful what some of those ancient wise men foresaw. Did Nahum get a foreglimpse of automobiles when he wrote: "The chariots shall rage in the streets. They shall jostle one against another in the broad ways; they shall seem like torches; they shall run like the lightnings."

PROPHECY FULFILLED

Coming down the ages to some of the later men and women of vision, did Mother Shipton foresee railroad trains, automobiles, wireless telegraphy, submarines, and flying machines when in 1481 she wrote:

"Carriages without horses shall go;
Accidents fill the world with woe.
Around the earth thoughts shall fly,
In the twinkling of an eye.
This world upside down shall be,
And gold be found at the root of a tree.
Through hills man shall ride,
And no horses be at his side.
Under water man shall walk,
Shall ride, shall sleep, shall talk.
In the air man shall be seen,
In black, in white, in green."

Did old Jeremiah get a foreglimpse of the aëroplane as an army scout when he wrote (Ch. 48:41): "Behold he shall fly as an eagle and shall spread his wings over Moab. Kerioth is taken, and the strongholds are surprised."

But there can be no doubt as to what Tennyson was prophesying when he said:

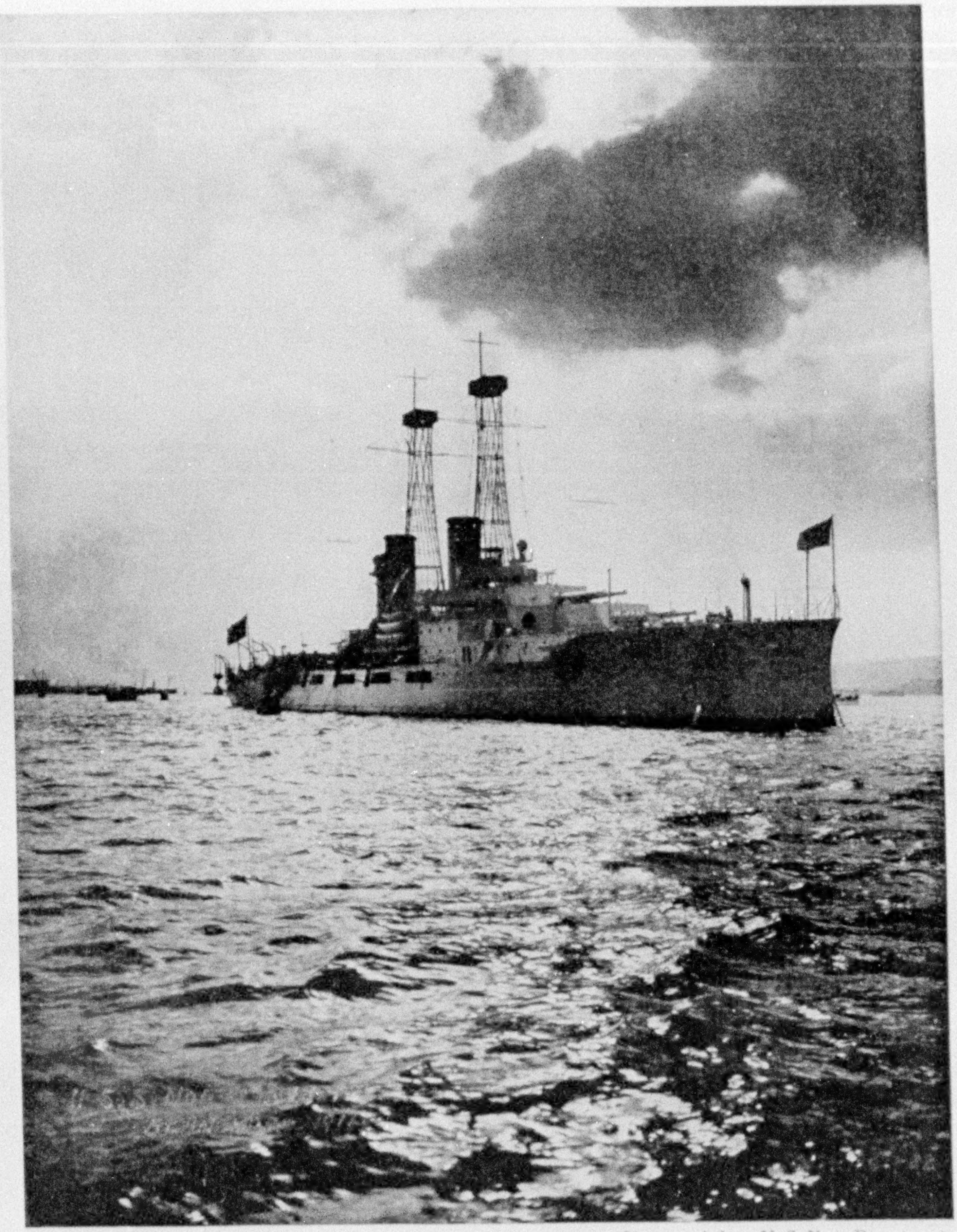
"Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down the costly bales;
Heard the heavens fill with shouting, and there rain'd a ghastly dew,
From the nations' airy navies grappling in the central blue."

Jules Verne a few years ago stimulated the imagination when he permitted his fancies to run riot and thrilled us with what seemed stories of the impossible in his "Twenty Thousand Leagues under the Sea." What royal fiction it was and how we reveled as he gave us eyes to see ships anchoring upon coral reefs and speeding on their missions without making a ripple upon the surface of the ocean!

New discoveries and twentieth century genius have translated Verne's dream into the most deadly instruments of destruction.

In the "Lay of the Last Minstrel," Walter Scott sang of another wizard:

"In these far climes it was my lot
To meet the wondrous Michael Scott,
A wizard of such dreaded fame
That when, in Salamanca's cave,
Him list his magic wand to wave,
The bells would ring in Notre Dame!"



Photograph from U. S. Navy Department

THE FIGHTING TOP WITH ITS WIRELESS CROWN

Truly the miracle of the twentieth century has been the discovery of radio transmission; it is the marvelous fulfillment—a fulfillment which we could not believe unless we had heard it with our own ears—of the story of Michael Scott waving his wand in Salamanca's Cave and thereby ringing the chimes in the cathedral spire.

THE SPEED OF ELECTRICITY

The human voice, projected by wireless telephony, can travel around the earth about seven times in a second. One can speak to a place half way around the earth in one-fourteenth of a second.

What a marvelous thing is the human voice! The Scripture itself declares to us that the Almighty incarnated in the forerunner of the Christ, the human Voice; so that we are told that the strange prophet of the Judean deserts, who wore camel's hair and whose food was the honeycomb and the fruit of the wild locust, was "the Voice of one crying in the wilderness."

And now what a wonderful thought it is, that the human voice, with all its power, with all its influence, with all it has meant to literature and life, has, under the power of the wizard genius of man, been made to overleap continents and oceans!

"A BEATEN TRACK TO HIS DOOR"

It is to American engineers that the world owes the perfection of wireless telephony. Pursuing his studies quietly and unknown to the world for many years, Carty has written his name on the roll of honor of science. Emerson said:

"If a man can write a better book, preach a better sermon, or make a better mouse-trap than his neighbors, though he build his house in the woods, the world will make a beaten track to his door."

While the world is indebted to the engineers and scientists for the invention, it is due a further debt of gratitude to Mr. Theodore N. Vail for its adaptation to the needs of commerce and the organization and perfection of a system for rendering it useful in this way. They built upon the work of Marconi, and Marconi built upon the work of Bell and Watson.

As Sherlock Holmes, the wonderful detective genius, springing from the fertile brain of Conan Doyle, had his ubiquitous and ever useful Dr. Watson, so did Alexander Graham Bell, the Sherlock Holmes of modern science, have his Watson. In capturing the marvelous secrets of nature we can hear Graham Bell give the first message ever heard over the telephone: "I want you, Watson; come here."

Only last year scientists from the old country came to Washington and, at the Naval Observatory, studied and worked with American scientists to determine the difference in latitude. Wireless messages exchanged between Paris and Washington, a distance of 3,000 miles, demonstrated the perfection reached in that wonderful field of science. It seems but yesterday that we were incredulous, as the papers brought the uncanny stories that messages could be sent from coast to coast without wires.

PERFECTING THE NAVY'S WIRELESS SYSTEM

The Navy has been a pioneer in this conquering of the waves of the air, and its high-powered stations at Arlington, San Diego, in Panama, in Honolulu, Guam, Manila, Tutuila, Alaska, etc., will shortly in very truth put a girdle around the earth, fulfilling Puck's promise "to put a girdle around the earth in forty seconds."

Working in coöperation with Mr. Carty in his remarkable achievement, was Capt. W. H. G. Bullard, U. S. N., now superintendent of the Naval Radio Service, who placed at Mr. Carty's disposal the facilities of our stations at Arlington and other places for perfecting his invention. To the Bureau of Steam Engineering of the Navy Department is due the credit of the planning and equipment of these stations in a manner which has made the radio service of the American Navy the greatest radio service in the United States or the world today. Among the officers who have been conspicuous in bringing the service to its present state of efficiency are Capt. S. S. Robison, Lieut. Commander A. J. Hepburn, and Lieut. S. C. Hooper. To the latter more than to any one else, under the direction of Rear Admiral Robert S. Griffin, is due the credit for the Navy's present system of communication. The Navy has opened 25 stations to commer-

Photograph by Paul Thompson

THE TELEPHONE GIRL

The telephone girl is no more an angel than the rest of humanity, but her patience in the face of impatience, her courtesy in the face of brusque demand, her desire to oblige in the face of ugly tempers and crusty dispositions, is wonderful. She will always "beat you to it" when you feel like smiling.

XUM

cial business, and besides that every ship of the Navy is herself a commercial station, as all private messages handled are paid for by the senders.

In addition to the paid commercial business carried on by the naval radio stations, the system renders a free service of inestimable value in the daily transmission from Arlington and other stations of the time signals from the Naval Observatory, thus enabling ships at sea, even though far beyond the range of transmission of their own equipment, to determine their exact chronometer correction. Even sailing vessels, which habitually make long voyages and which have no power with which to operate a radio station of their own, may at trifling expense be equipped to catch this signal. Our own naval ships have carried it far into the Mediterranean.

In addition to this, over 300 jewelers throughout the country are now receiving the Navy's time signal by radio, and there is little doubt but what this number will grow to 3,000.

WHEN WAR'S LIGHTNINGS FLAME THE SKY

During the war in Mexico, when all land wire and cable communication between the United States and the southern part of Mexico was interrupted, the naval vessels on the west coast afforded the only means of communication. The air has been put under contribution and is now the fleet-assigned servant of man. The S. O. S. call has reduced the terrors of the deep.

Another interesting feature of this free radio service, which should be of incalculable benefit to shipping, is found in the radio compass now under construction at the Fire Island station, near the entrance to New York harbor. This device is intended to send out radio signals of such a character that a vessel in a fog may get a close approximation of her "bearing," or compass direction, from the station. By means of observations taken 5 or 10 miles apart, it should be possible for the vessel to determine her actual position with fair accuracy. This is the first installation of this type to be made in this country; but a second installation of different type, though answering the same purpose, is undergoing tests at Cape Cod.

THE WIDE WORLD TO COME WITHIN EAR-SHOT

The signals sent out by the radio compass at Fire Island will necessarily be limited as to range; but the Cape Cod installation will allow of a coasting ship calling the station in the usual manner from any distance within the ship's ordinary range and receiving a definite reply as to her bearing from the station. In the case of Fire Island the ship will determine her bearing from the character of the signals continuously emitted; for Cape Cod the station determines the bearing of the ship from her calling signal and sends the information back. If these installations prove as successful as anticipated, the radio operators of ships will become an important part of the navigating force.

In the fall of last year the human voice was successfully transmitted by radio from the Naval Radio Station at Arlington clear across the continent to the station at Mare Island, Cal., 2,500 miles away; and several months later, sitting at his desk in the Navy Department, the Secretary of the Navy sent the first order ever issued by the Navy by wireless telephony to Rear Admiral Usher, commandant of the New York Navy Yard.

The radio system of the Navy has been so thoroughly and completely organized and the Navy's system of communication, under the efficient organization of the Office of Naval Operations by its present chief, Rear Admiral Benson, is now so effective that messages to every part of the world can be sent at any time of the day or night; and this division has been put under the supervision of a thoroughly trained naval officer, within 50 feet of the desk of the Secretary of the Navy, and in immediate touch with the officers and officials of every department.

NOTE TO MEMBERS

Owing to unprecedented conditions in the importation of special inks for color work, together with the very large increase in the edition of the NATIONAL GEOGRAPHIC MAGAZINE, due to its continually growing popularity, it has been necessary to postpone until the April number the thirty-two pages of four-color work, illustrating the article on "America's Playgrounds," which was announced for the March number.

A REGULAR "Bow of Promise" for perplexed housewives—A good part of the labor and worry cut out of the every-day dinner problem. Time saved. Fuel saved. A hearty, wholesome, satisfying dish ready on the minute for any meal or any emergency—You have all this in

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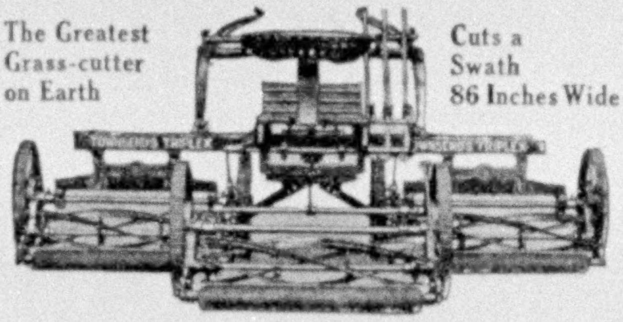

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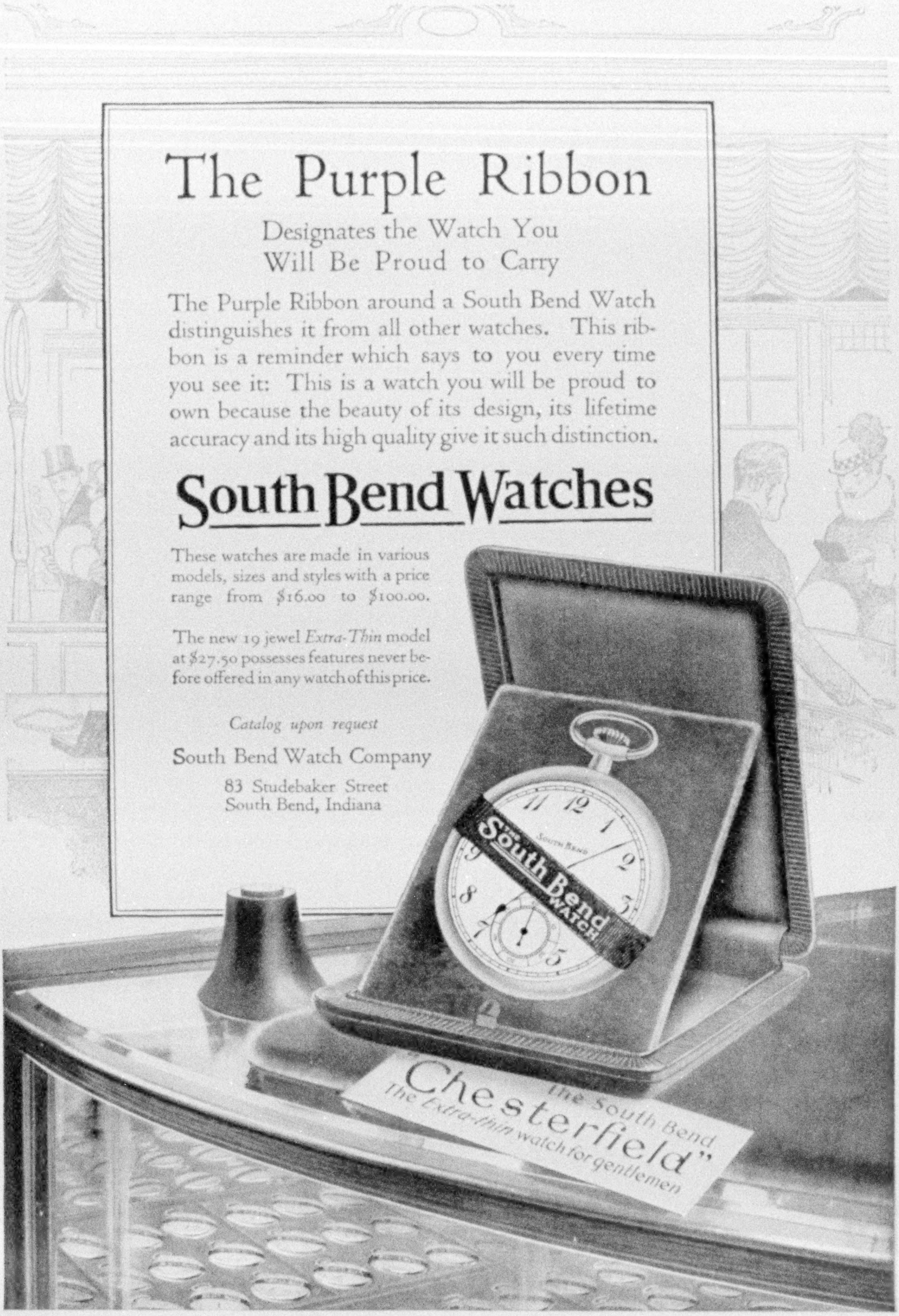
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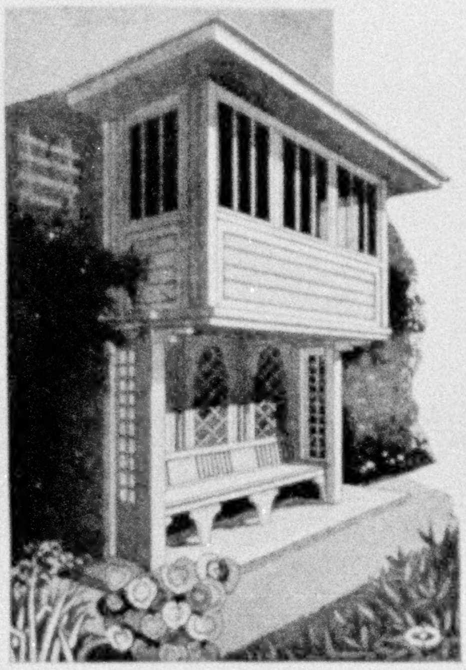

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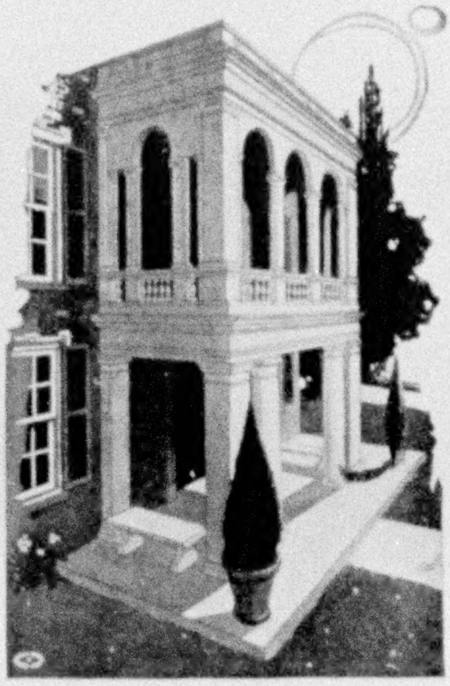

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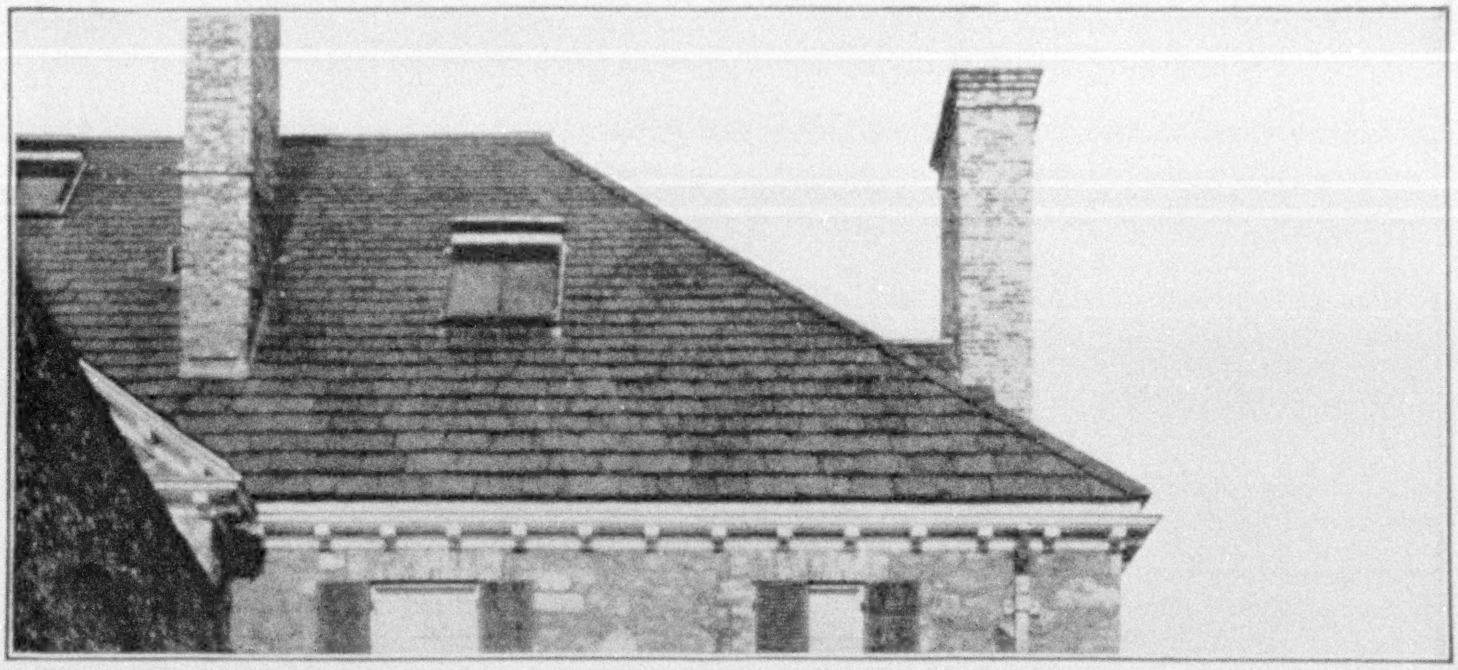

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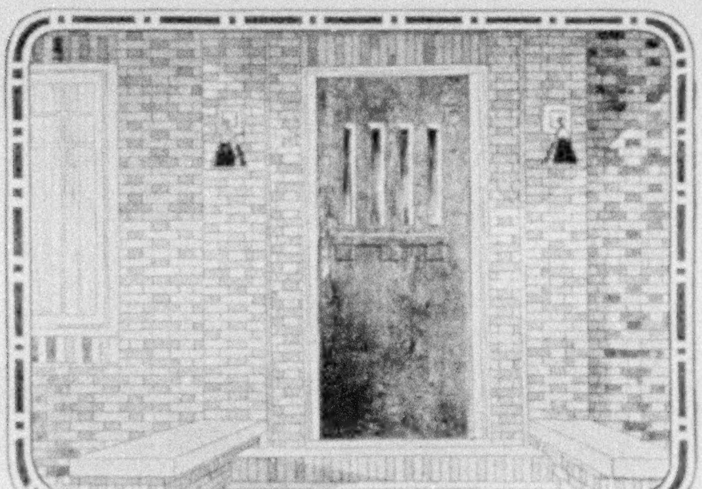

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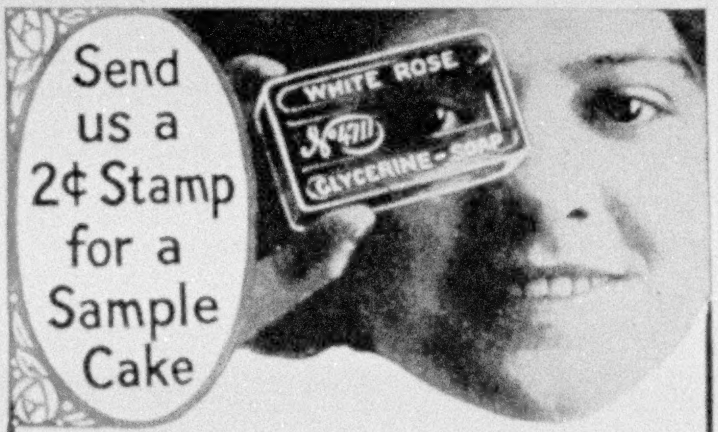

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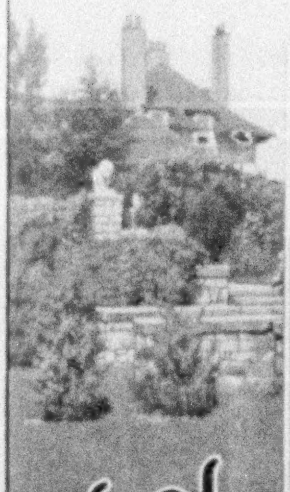

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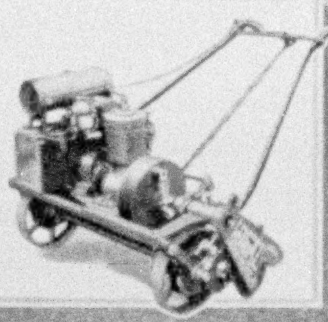

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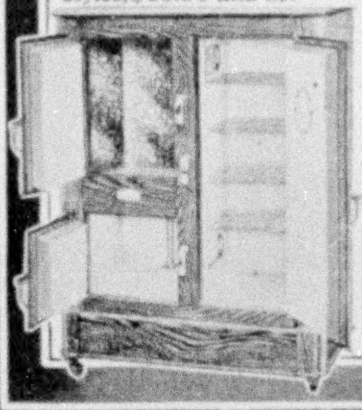

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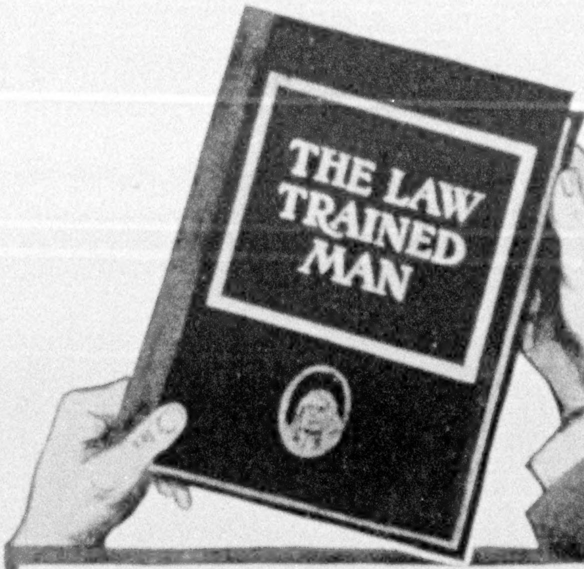

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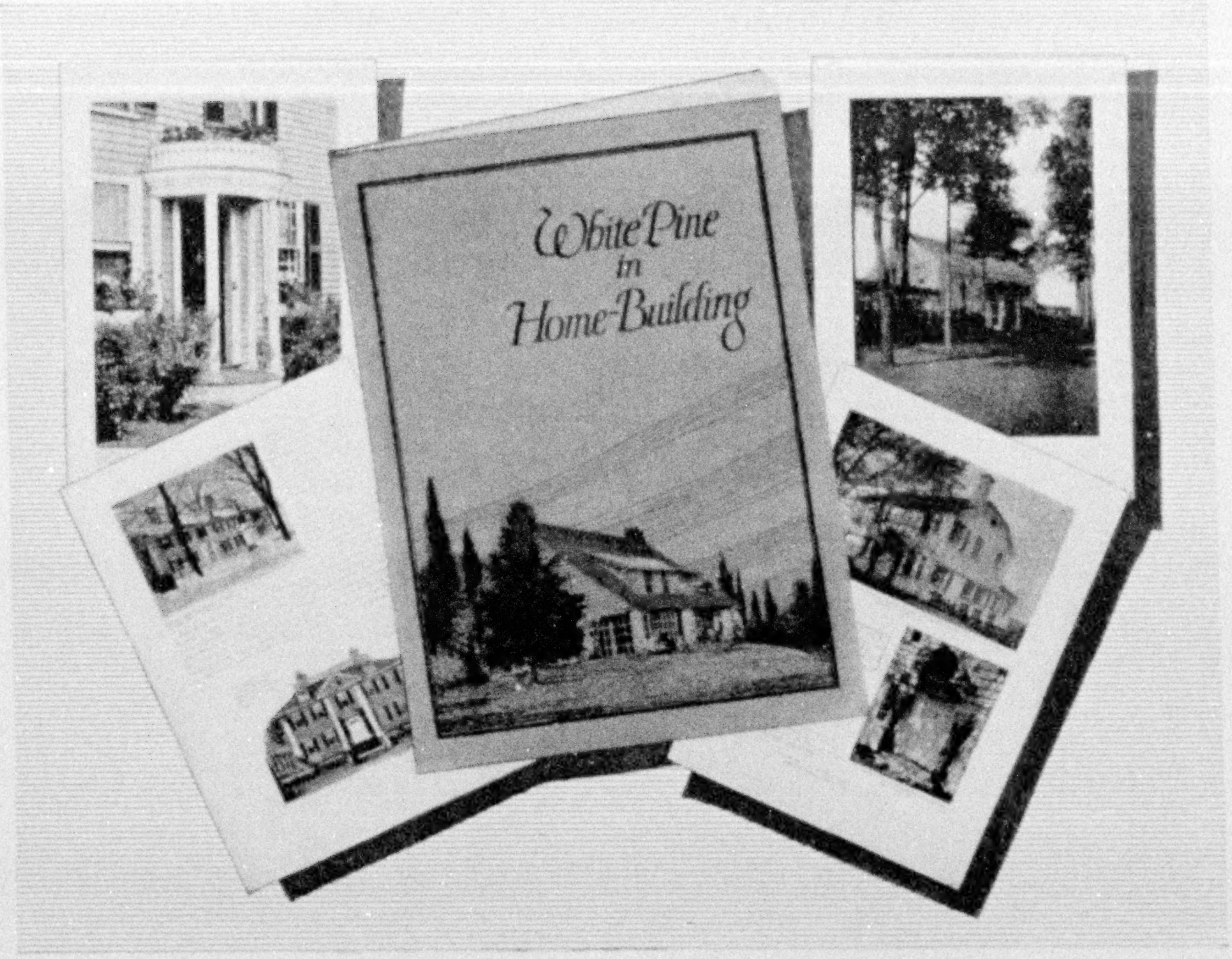

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Some refrigerators have a high percentage in one of these features: some in another—some in two or three. But the high average in *all five points* goes to the

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Cleanliness is assured by its food compartments of *solid porcelain*, over an inch thick, with all corners rounded. No enamel to chip, no cracks or crevices. Easy to keep clean.

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Mr. Dodson is a Director of the Illinois Audubon Society

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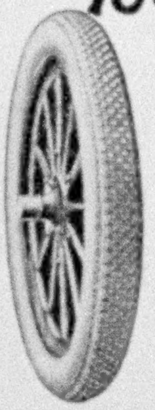

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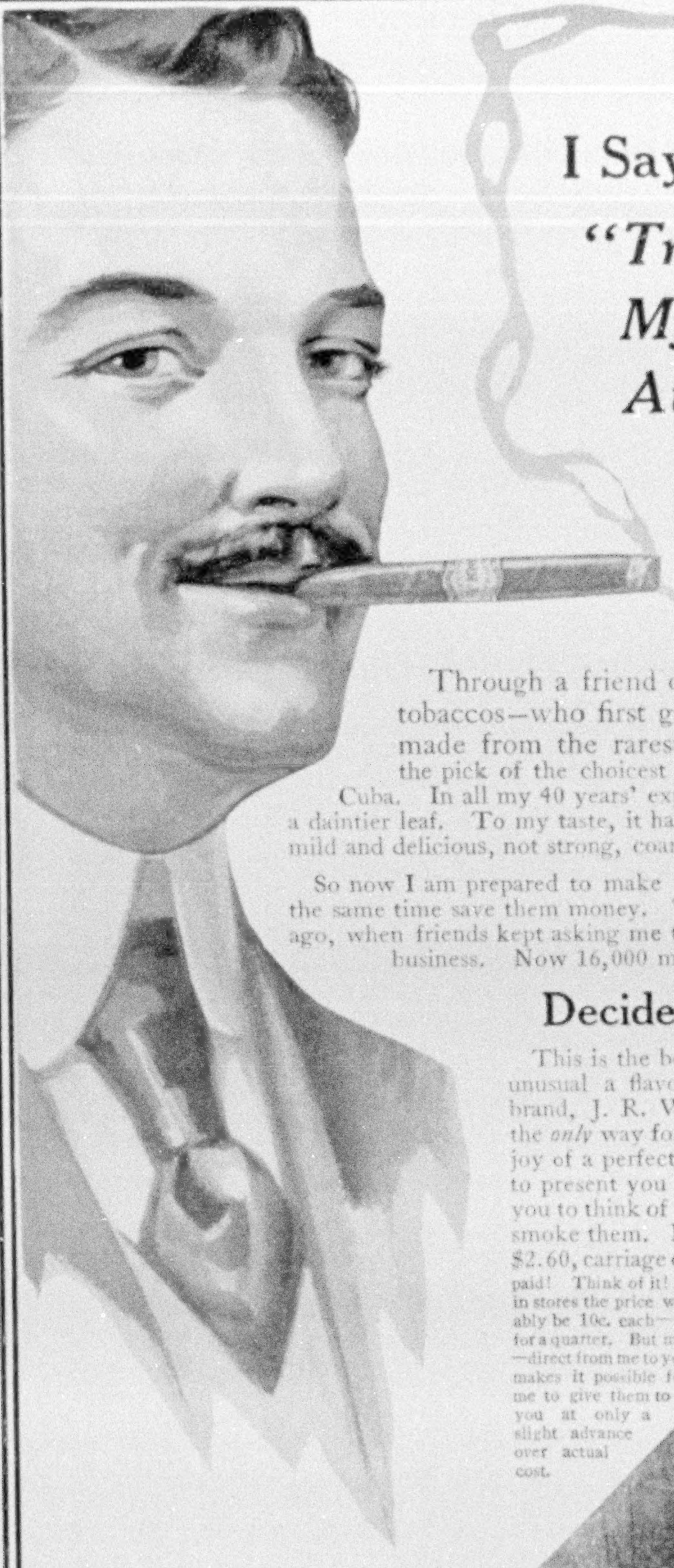

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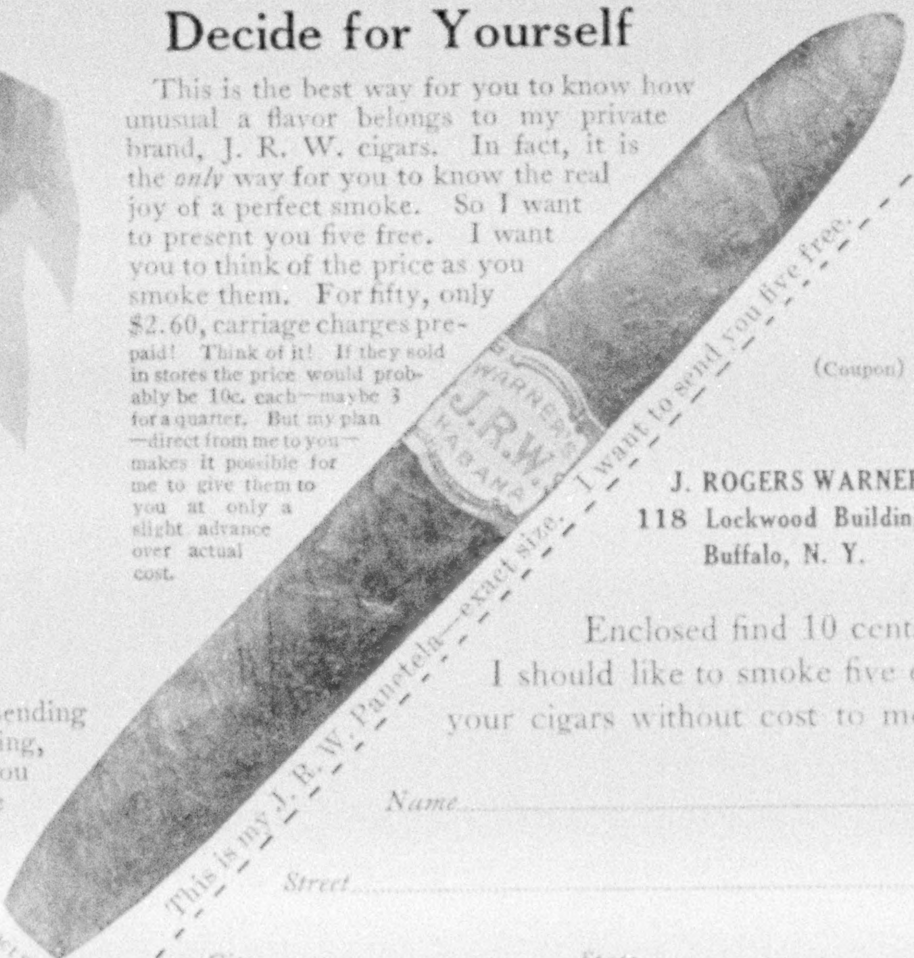

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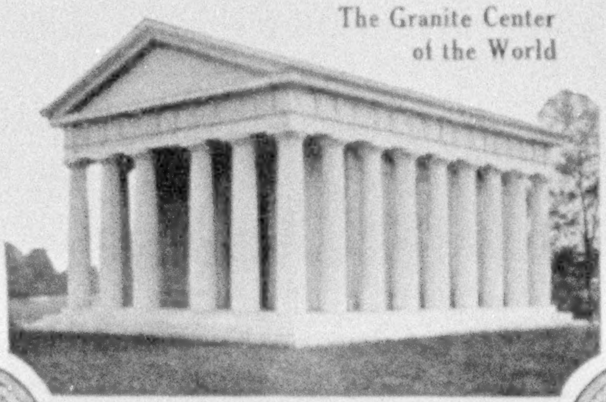

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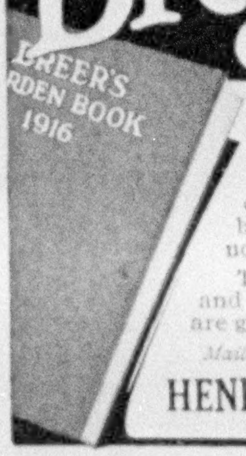

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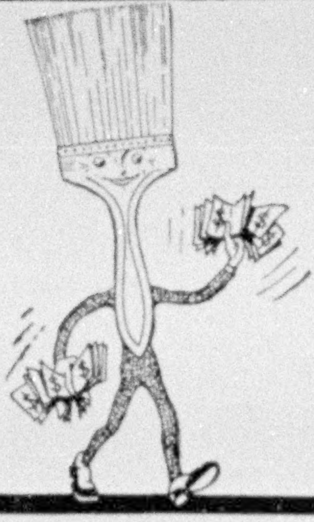

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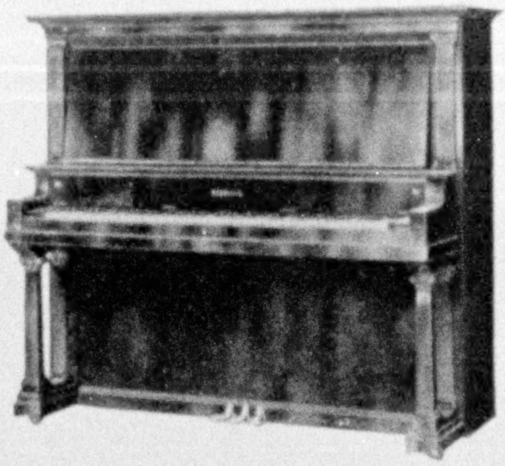

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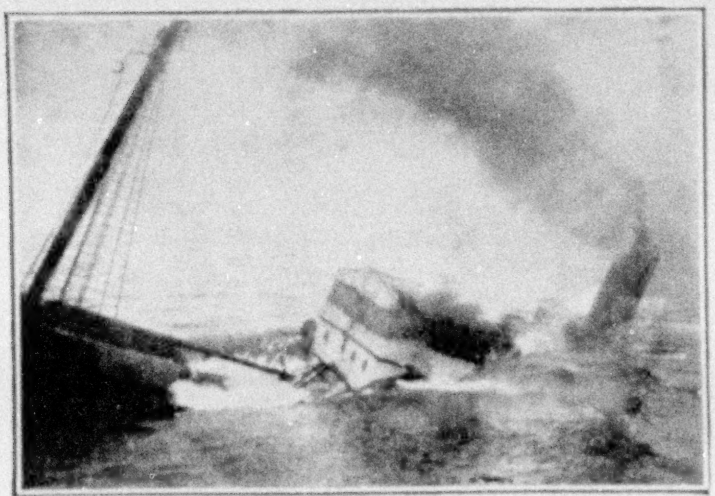

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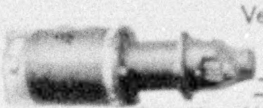

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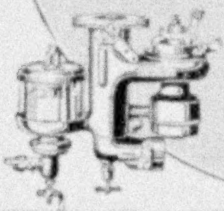

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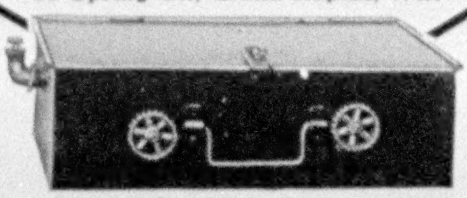

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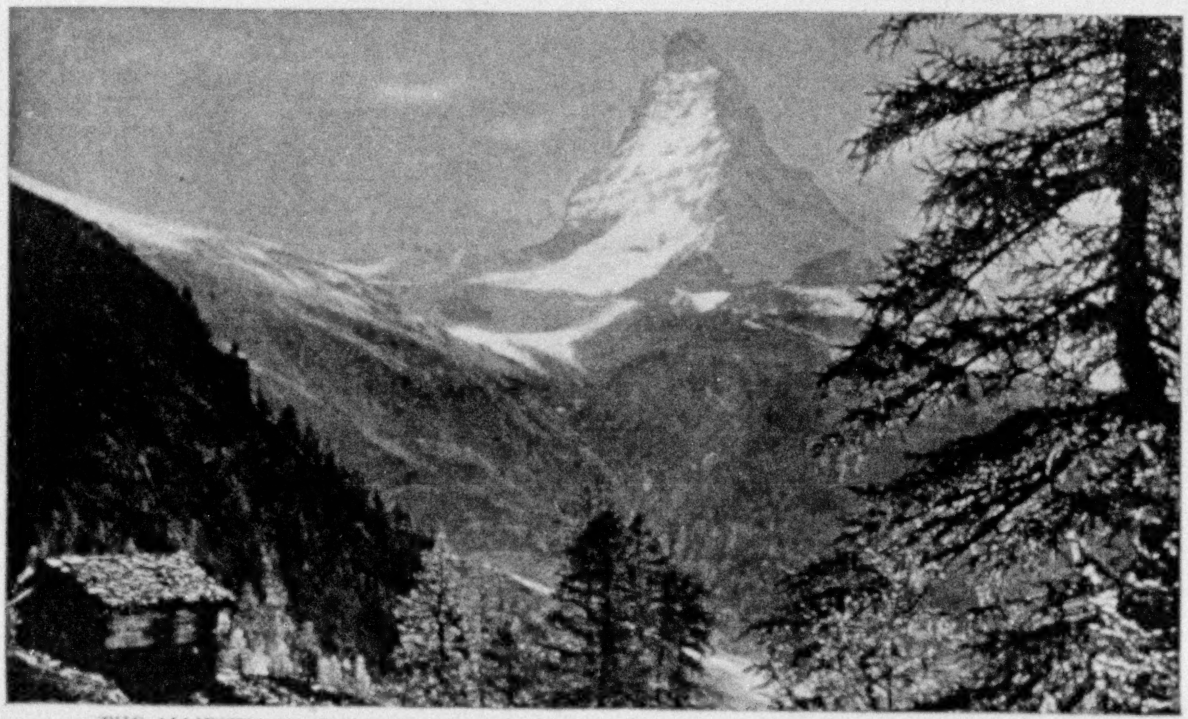

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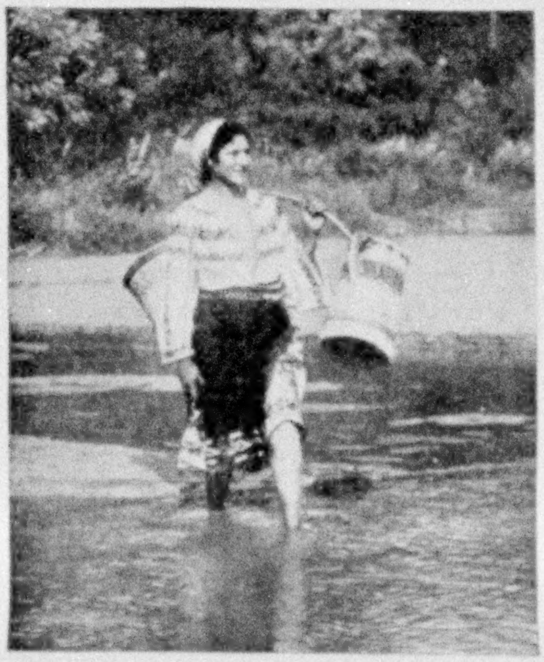

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10 x 13 inches, in colors

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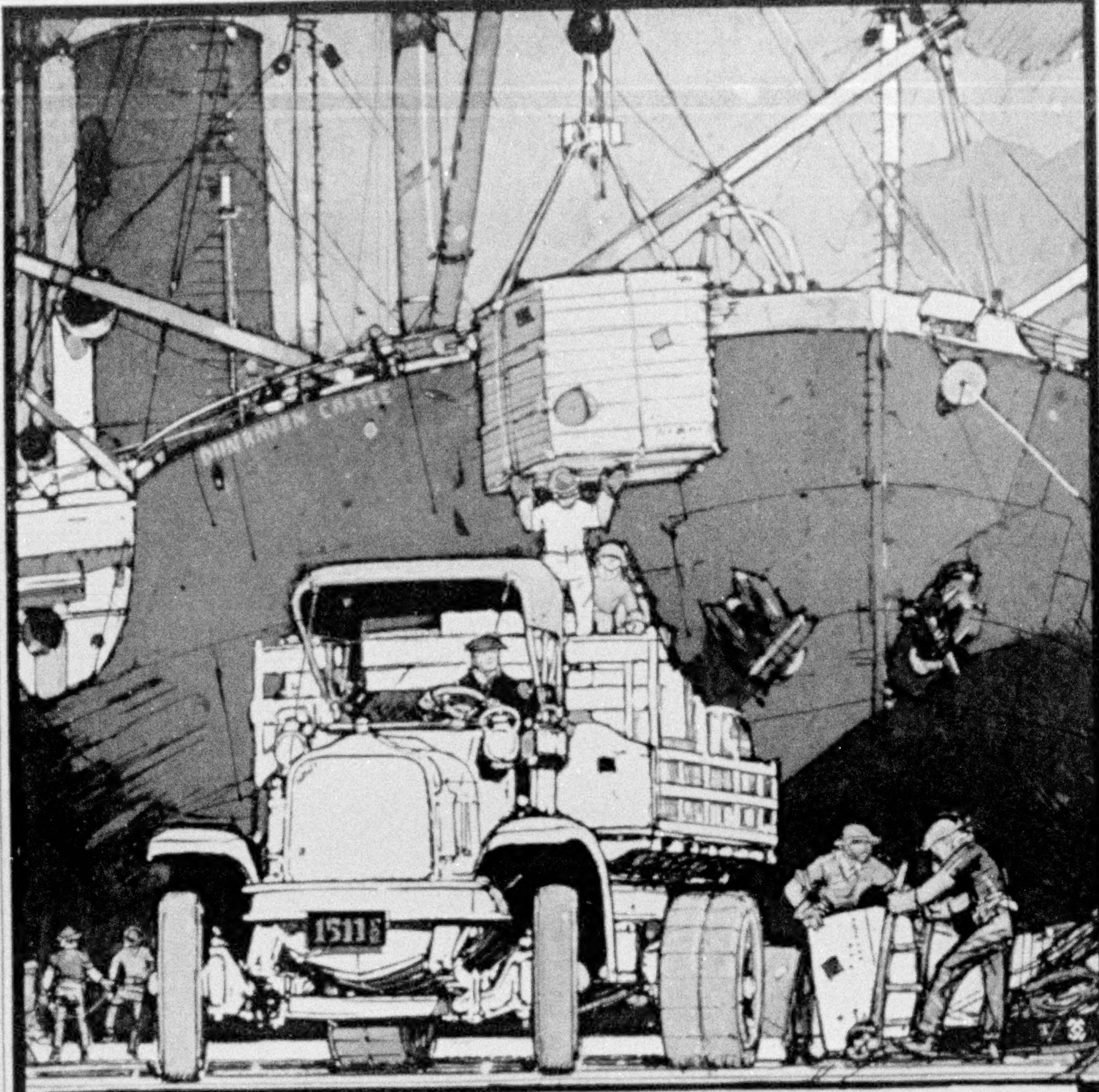

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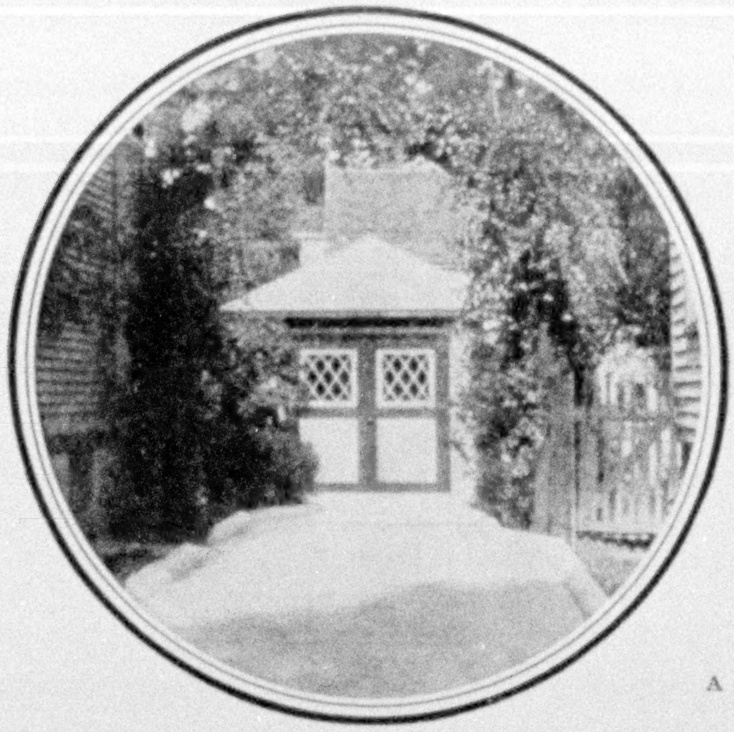

A concrete garage and concrete driveway.

You Can Use Concrete in Many Ways

It is very simple. Mix clean sand, pebbles, or broken stone and cement, with pure water, in proper proportions. Dump the mixture into wooden forms, nailed together. Level, smooth with a wooden trowl and leave to harden.

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Requires No Repairs

Once properly hardened, a structure lasts indefinitely. It actually increases in strength with age, and shows no more wear than a solid slab of stone. The periodic expense of repairing and repainting other materials is entirely avoided. The upkeep is practically nothing.

Concrete is Rot-Proof

Weather makes no impression upon it. The soil moisture which rots away steps, fence posts and porches, made of wood, does not even discolor concrete.

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No rat can eat through concrete, and there need be no joints nor cracks in a concrete structure to give vermin an opening. It is easily cleaned and kept sanitary.

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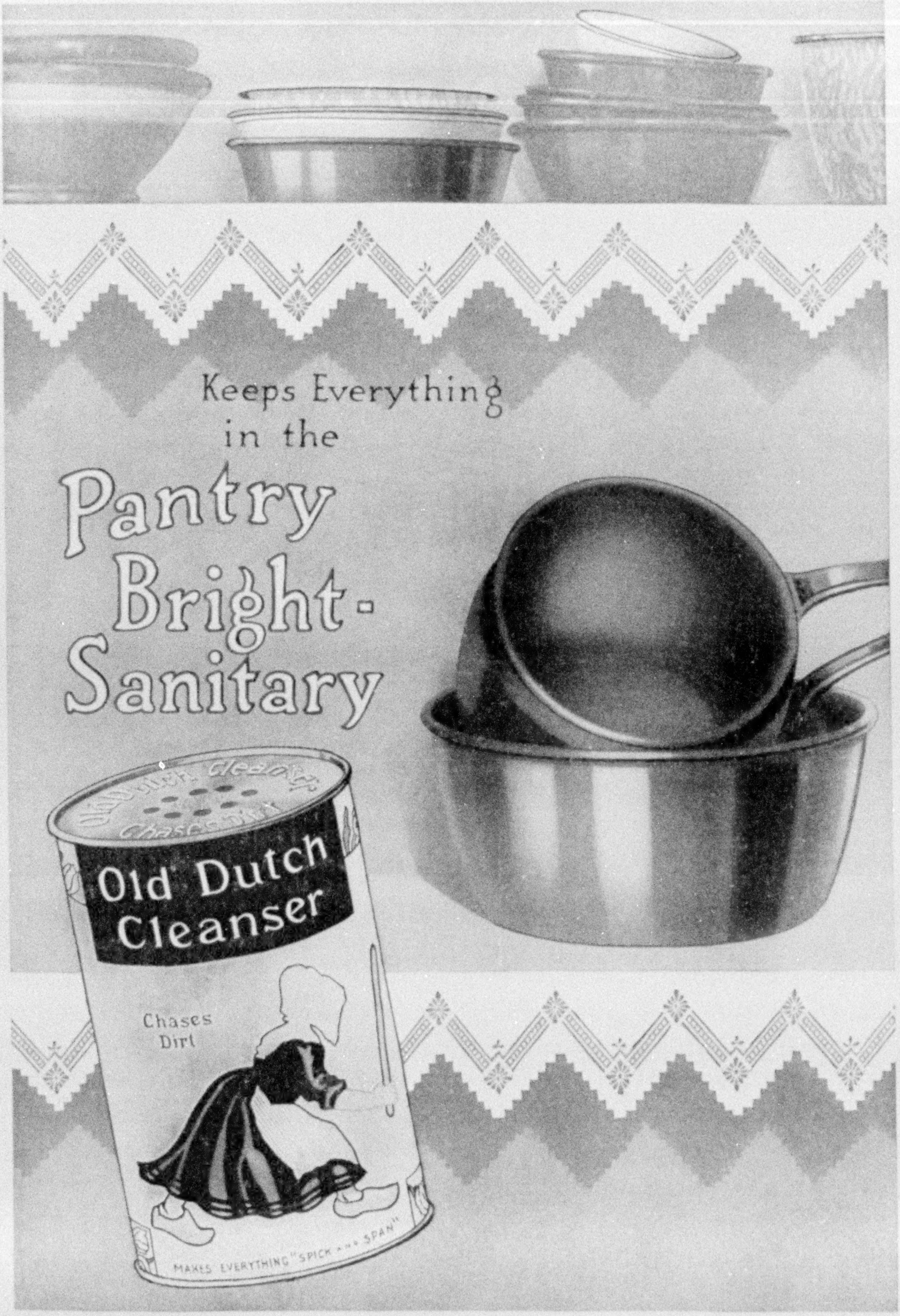

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